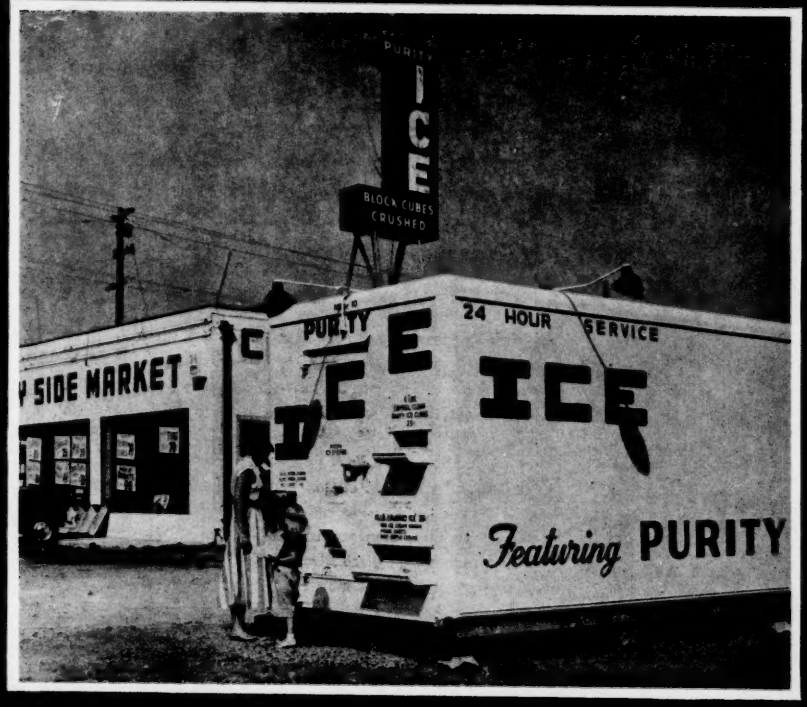
ICE and REFRIGERATION



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MARCH • 1951

Ice Men Offer Ideas on Selling New Uses for Ice . . . Page 22

BETTER PROTECTION ...BIGGER SAVINGS...

...when you use TEXACO MARFAK

Lower chassis maintenance costs are a familiar story to operators who use *Texaco Marfak.* Here's a lubricant that really stays in the bearings — in spite of washboard roads, heavy loads, or splashing. With *Texaco Marfak,* you can count on extra hundreds of miles of protection against rust and wear . . . on longer parts life and lower costs.

Lower wheel bearing maintenance costs, too, are assured when you use *Texaco Marfak Heavy Duty.* It seals out dirt and moisture, protects against wear and rust, and won't leak onto the brakes. Greater protection, greater safety — and no seasonal change required.

In your engines, use *Texaco D-303 Motor Oil.* It's a fully detergent and dispersive oil that cleans as it lubricates . . . assuring greater protection against wear . . . lower maintenance costs and fuel consumption.

To improve and, at the same time, simplify your lubrication procedures, call in a Texaco Lubrication Engineer. You can reach him through the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or by writing The Texas Company, 135 East 42nd Street, New York 17, N. Y.

More than 350 million pounds of MARFAK have been sold!

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TEXACO Lubricants and Fuels

FOR ALL TRUCKING EQUIPMENT

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BUTCHER BOY COLD STORAGE DOOR CO.

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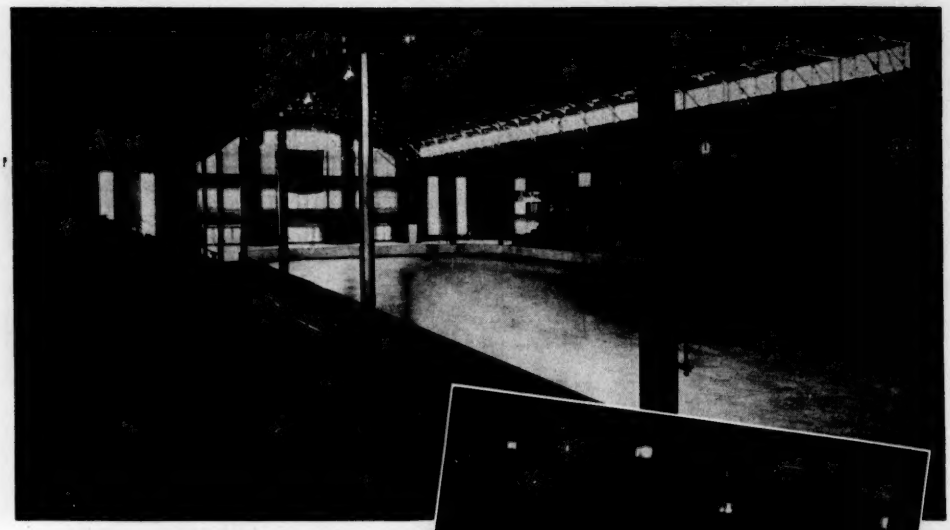

ANOTHER IMPRESSIVE ENGINEERING ENDORSEMENT . . .

Rensselaer Polytechnic Institute's NEW RINK USES BYERS WROUGHT IRON PIPE

When Rensselaer Polytechnic Institute—one of the oldest and best-known engineering colleges in the country—built a modern rink in its Field House last year, Byers Wrought Iron pipe was given another significant vote of confidence. J. H. Brelsford, engineer in charge of new construction; L. B. Combs, Head, Department of Civil Engineering; and Keis & Holroyd, Engineers, united in choosing wrought iron for rink piping. Durability was naturally of first importance in the minds of the specifiers, as the rink was installed to revive ice hockey as a major sport, and also to permit the staging of exhibition professional games.

An interesting "by-product" use of the installation was improvised during the commencement ceremonies. The refrigeration equipment was turned on, producing a pleasant, comfortable coolness throughout the Field House, despite the sweltering weather outside. This innovation was much appreciated by the audience.

More than eight miles of 1¼-in. Byers Wrought Iron pipe, fabricated into hairpin shaped units on 4½-in. centers, was laid in the 16,000 sq. ft. of rink area. All control valves for each coil were located at one side, for convenience. Ryan Company, Inc., fabricated and installed the piping.

Wrought iron has proven its superior durability, over and over again, in rinks in all areas. We will be glad to send you a report of a survey of 23 rinks that give specific examples.

> Wrought iron's longer life springs from its unique nature. Tiny fibers of glass-like silicate slag, threaded through the body of high-purity iron, halt and disperse corrosive attack, and also anchor the initial protective film—which shields the underlying metal.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. Export Division: New York, New York.

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WROUGHT IRON

TUBULAR AND HOT ROLLED PRODUCTS

ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

Ice and Refrigeration

VOLUME 120 NUMBER 3

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March, 1951

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"Fine food demands cleanliness so we insist on Packaged Processed Ice"

SAYS W.C. GENTRY, SAVOY GRILL, KANSAS CITY, MO.

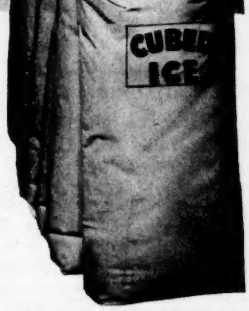
For nearly 50 years the Savoy Grill at 9th & Central, Kansas City, has been known for its live Maine lobster, fresh seafood and prime steaks.

One-Trip Paper Ice Bags Put New Life in the Ice Business

PEOPLE who sell food can't take a chance with cleanliness! That's why so many of them insist on buying their ice in Union One-Trip Paper Ice Bags that lock out all dirt and contamination.

And it's lucky for you they do! Consumers ice more often with convenient-sized, easy-to-handle Union Paper Ice Bags. They are easily carried and speed up handling on the platform, in loading and at the delivery point. And the double layer of Union wet-strength, water-repellent paper acts as an insulator to retard melting.

Hundreds of ice companies are now using Union Paper Ice Bags. Write for further information and free samples.



Wet-Strength Paper Ice Bags have tremendous strength even when soaking wet . . . thanks to a water repellent resin that binds the fibres of the paper firmly together.

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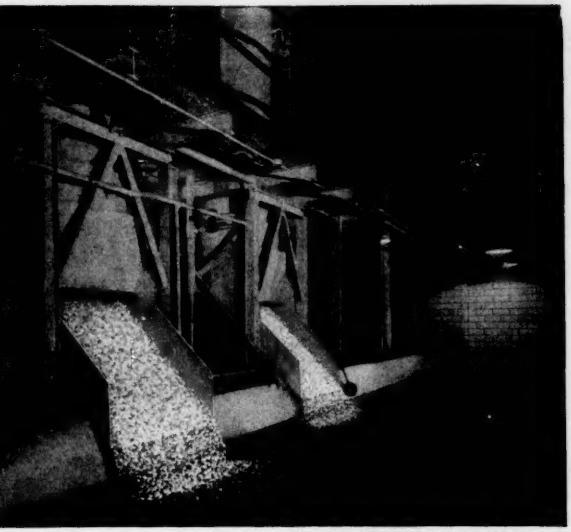
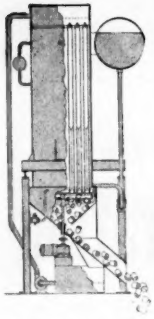
connected refrigeration capacity provides equivalent of
300 TONS
COLD WATER
refrigeration for Wort Cooling
with the...



Tube-Ice Machines and Latent Heat Water Tank at Burkhardt Brewing Co., Akron, Ohio.

Vogt Automatic TUBE-ICE MACHINE



HOW THE TUBE-ICE MACHINE FUNCTIONS

In making ice, water is pumped to the top of the freezer and flows downward along the inside walls of tubes into a water tank. Refrigerant in shell surrounds tubes and freezes water into cylinders of ice. An automatic timing mechanism operates suitable valves to control all functions of the machine. Ice is freed from the tubes by thawing when the refrigerant is displaced by high pressure warm gas from the compressor.

To cool water only the evaporating pressure is raised above that required for making ice.

Employing direct application of the refrigerant, all expense incidental to other systems is eliminated.

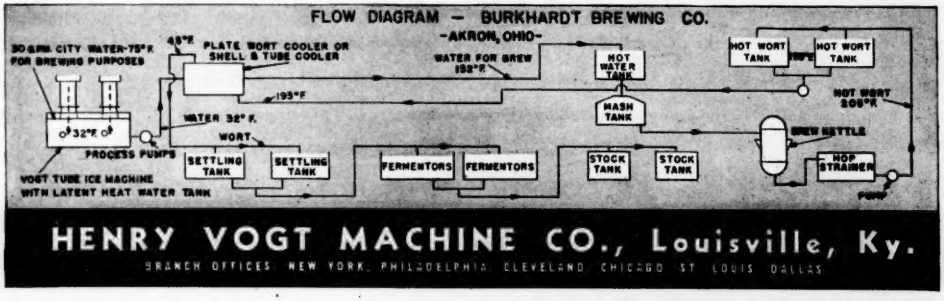
Patent Numbers 2,200,424, 2,239,234, 2,396,308. Other Patents Pend.

The Burkhardt Brewing Co., Akron, Ohio, saves more than 50% of their cold water refrigeration cost with a modern Vogt Water Cooling System!

Here, two Vogt Automatic Tube-Ice Machines make cold water during the day and Vogtice at night, thus utilizing refrigerating capacity around-the-clock. The stored ice acts as a flywheel by cooling make-up water to augment the supply made by the machine to meet the peak wort cooling loads. The refrigeration load demand is thereby leveled out with a resulting reduction in demand charges on electrical energy, and the use factor of installed equipment approaches 100%.

Additional economy is realized from this system since the water, after cooling the wort, goes into the next batch of beer. Thus no heat potential is wasted but all is used to do useful work.

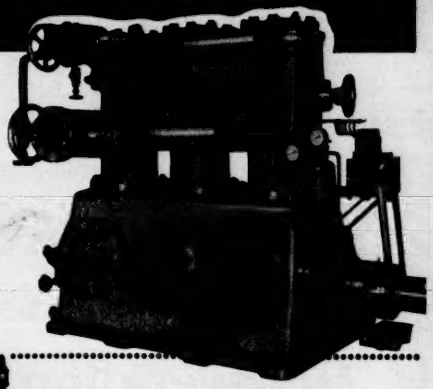
A flow diagram of the Burkhardt Brewery is shown below.



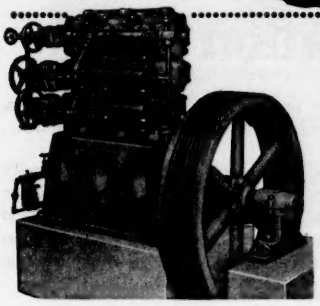
HENRY VOGT MACHINE CO., Louisville, Ky.

BRANCH OFFICES: NEW YORK, PHILADELPHIA, CLEVELAND, CHICAGO, ST. LOUIS, DALLAS

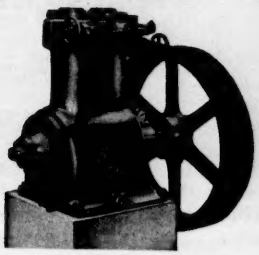
IN REFRIGERATION
it's All in knowing
HOWE



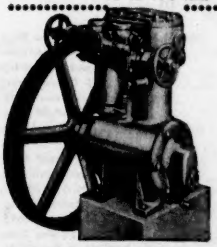
STANDARD AMMONIA COMPRESSORS, sizes to 150 tons, are designed from 39 years of specialization. They keep products at profit-quality peak by exact temperature and humidity control.



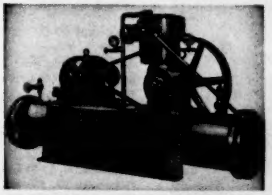
MULTIPLE-EFFECT COMPRESSOR
15 to 150 tons



MODEL G COMPRESSOR
10 to 20 tons



MODEL A COMPRESSOR
2 to 8 tons

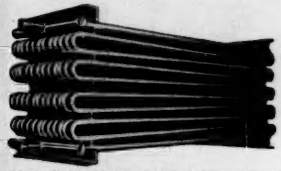


AMMONIA COMPACT UNITS

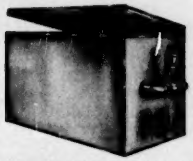
HOWE

HOWE POLAR CIRCLE COILS

FIN COILS

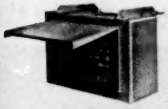


PIPE COILS



ICE BUILDER TANKS

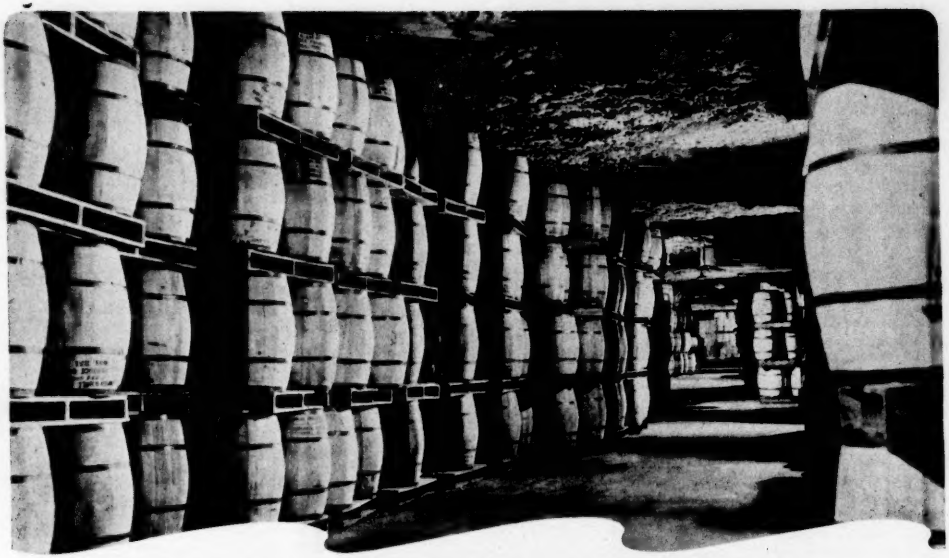
UNIT COOLERS



RAPID FREEZE UNIT COOLER

ACCUMULATORS, OIL TRAPS AND RECEIVERS

SHELL AND TUBE CONDENSERS AND COOLERS



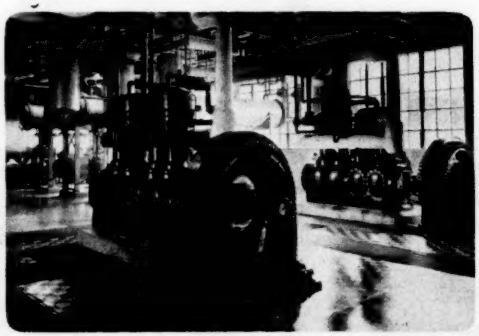
GIGANTIC UNDERGROUND STORAGE USES

Frick Refrigeration

Originally a limestone quarry, the Natural Cooler Storage of the United States Department of Agriculture near Atchison, Kansas, is one of the largest refrigerated warehouses in the world, having capacity for 3,000 carloads.

A temperature of 32 degrees F. is held in the great cave by two Frick 4-cylinder compressors, driven by motors totalling 600 horsepower.

Other large cold storages using Frick refrigeration, including those holding 44 million pounds of frozen foods for Seabrook Farms at Bridgeton, New Jersey, are in service throughout the world.



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For that important cooling job of yours, specify Frick air conditioning, refrigerating, ice-making or quick-freezing equipment. Frick equipment is furnished in all commercial and industrial types and sizes—there's a Frick refrigerating machine to suit the exact needs of your business.

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Kansas City 6, Mo.	424 Dwight Bldg.
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Memphis 3, Tenn.	1012 Sterick Bldg.
New Orleans 12, La.	910 Queen & Crescent Bldg.
New York City 17	370 Lexington Ave.
Oklahoma City 3, Okla.	127 N.W. 13th St.
Palatka, Fla.	Abstract Bldg.
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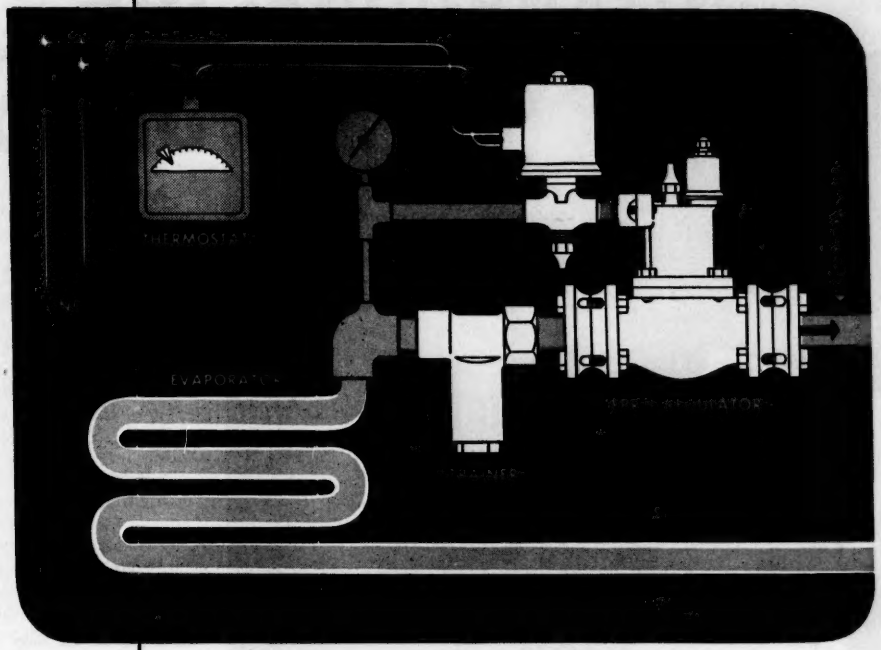

Try this performance-tested ALCO team—the EPR for accurate evaporator pressure regulation, *plus* the Solenoid for positive suction stop. Together, they solve the toughest close-control problems.

This ALCO Solenoid-EPR Combination is widely used on installations where pinpoint control is important: in the handling of plasma, biologicals, plastics and synthetics, and for food preservation on commercial and combatant ocean vessels throughout the world.

Try it on your next job where close control counts.

For further details, write for Bulletin 183.

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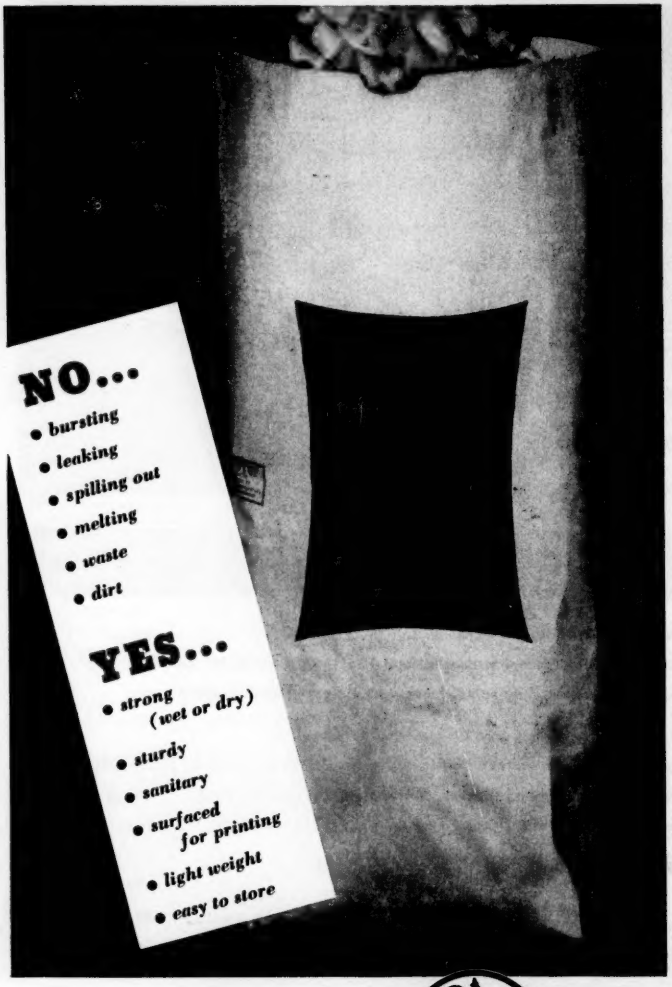

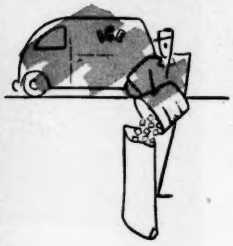

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In The Spotlight

REFRIGERATED WAREHOUSEMEN meeting in Boston for their annual convention February 6 to 8 gave specific attention to the growing problems of production and public relations. Practical aspects of the national emergency also heightened interest in the program. The report of this meeting starts on page 19. The American Warehousemen's Association meeting at the same time also gave special attention to the industry's part in the mobilization of resources to meet the needs of the times, as shown in convention report starting on page 13. The annual meeting of the Refrigeration Research Foundation held at Boston February 2 to 4 reviewed the work of the past year and planned future work. The report of this meeting starts on page 27.

THE AVAILABILITY of refrigeration equipment, with the increasing extent of government controls, has become a question of much importance to the managers and engineers of all refrigerating plants. The article on page 16 outlines the present situation, predicts a controlled materials plan of allocation, and suggests how to meet these new conditions.

PLANNING THE FUTURE of the refrigerated warehousing industry is based on the probable demands for storage of perishables. The Committee on Emergency Plans has this problem well in hand. The report of this Committee on page 17 sets forth the basic plans, operation procedure and a suggested supplement to the tariff.

THE EIGHTH International Congress of Refrigeration will be held at London, England August 29 to September 5, 1951. Outline of the program and other details are given in article on page 33.

COVER PICTURE: An ice vending station equipped to dispense block ice, crushed ice and ice cubes, located adjacent to a drive-in grocery and market. The customer is buying a piece of block ice. The Purity Ice Company, San Jose, Calif., sells its entire output through these modern ice vending stations. Story on page 39.

THE WAREHOUSING INDUSTRY now has the responsibility of providing storage facilities for immense amounts of food and fiber which will be necessary under the defense program now getting under way. A representative of the U. S. Department of Agriculture discussed this problem at the 60th annual convention of the National Association of Refrigerated Warehouses. His remarks are published in full, starting on page 25.

THE COLD STORAGE Advisory Committee has been set up by the National Association of Refrigerated Warehouses to consider the work being carried on under the Research and Marketing Act and to offer suggestions covering future work. The committee met in Washington recently to review the program now under way and to make recommendations for new work. Report of this meeting starts on page 31.

RESEARCH on fruit storage practices show that there is an optimum storage environment for each commodity, and the requirements for one product or even one variety may differ considerably from another. As research continues to develop information on commodity responses, refinements in storage facilities and practices will result. This subject is covered in the article starting on page 43.

FUR STORAGE men claim that certain retailers obtain lower insurance rates than they are entitled to by claiming that all their garments are stored, but storing only a part of them. The problem is outlined in the article on page 34.

COLD STORAGE HOLDINGS on January 31 were above those of a year ago and slightly above the five-year average. The outlook for the immediate future, however, is for a downward trend. Analysis of space and holdings is given on page 35.

VENDING MACHINES provide the only sales outlet for the Purity Ice Company, San Jose, Calif. How the business is conducted, advantages of vendors, some information on locations, and analysis of sales are included in the article which starts on page 39.

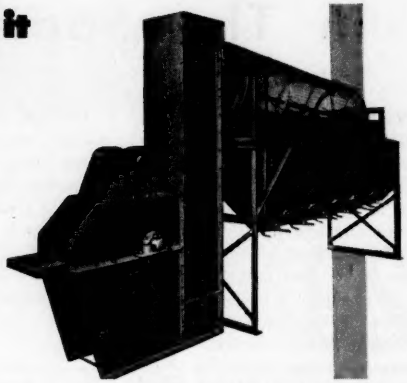
NEW USES FOR ICE as a means of cultivating new business were described by representatives of six ice companies at the recent National Ice Convention. To meet changing conditions, it was brought out, require new methods and cultivation of new fields. How this is now being done is told in detail in the article on page 41.

TAXI SERVICE FOR ICE is becoming popular. After arrangements with a taxicab company, the ice company lets it be known among party givers that special ice will be delivered by taxi, at regular prices plus taxi fare.

ICED TEA, according to a recent survey of a farm paper among its readers, is used by 72 percent of the families and by 229 persons in each 100 families.

ICE CREAM sales the first eight months of 1950 showed a decrease of 4.28 percent over the same period of last year. Adverse weather conditions are blamed. See page 62 for details.

it costs you money when it Snows in your plant



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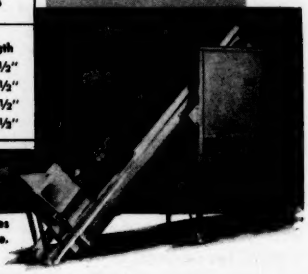
S-16-EB	SB-8	15	340 lb.	500 lb.	450 lb.	240 lb.	8'-5⅞"	16'-6½"
S-16-EC	SB-9	15	400 lb.	800 lb.	700 lb.	300 lb.	9'-5⅞"	16'-6½"
S-16-ED	SB-10	15	600 lb.	1200 lb.	1100 lb.	500 lb.	10'-5⅞"	16'-6½"



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7503

American Warehousemen's Association 60th Annual Meeting

IN THEIR annual meeting at Boston on February 5-8, members of the American Warehousemen's Association gave particular attention to their part in the mobilization of industry to meet the war created emergency. The call to arms was sounded by Horace Wilson, general president. He opened the meeting and established its objectives in a brief, direct manner. His talk follows:

J. Leo Cooke, Jersey City, N. J.
President, American Warehousemen's Association

My friends, we've all got a job to do! America's defense against the threat of communist aggression now facing her is everybody's responsibility. Doing something about it is going to be tough—tough on all of us—and it's going to take time. But we haven't any other choice than to roll up our sleeves and dig in—just as Americans always have done in time of trouble, from Bunker Hill to Korea.

You and I, as warehousemen, have a part in rearmament—a vital part in aiding in the production and distribution of the planes, tanks, guns and ships which apparently are the only answer to the threat with which we are faced. Let's face it. Until we restock the arsenal of democracy, we've got to bid farewell to "business as usual."

Much of the raw material of weapons for defense will pass through our hands. Much more of the food, clothing and equipment for the men behind the guns will occupy space in our facilities. Through efficient handling and utilization of scientific methods we can help immeasurably to speed the flow of defense materiel on its way to plug the gaping holes in our country's armour.

Warehousing has always provided balance-wheel control of the nation's economy by leveling out the peaks and valleys of production; by stabilizing employment; and by lowering costs to the consumer. These normal functions gain new significance in the abnormal situation of today's demands for record breaking productivity and its attendant strain on the economy.

AWA Officers for 1951

President—J. Leo Cooke, Jersey City, N. J.

Vice-president—J. L. Gagini, Omaha, Neb.

Treasurer—W. A. Morse, Minneapolis, Minn.

Secretary — William Dalton, Washington, D. C.

Increased Production

With the mighty upsurge in production necessary to meet these vital goals, our plants and our personnel will be sorely pressed. But we must meet these conditions, accepting them as responsibilities from which there is no escape, if we are to carry a fair share of the load. It's going to hurt. We'll be taxed heavily, worked hard, and faced with a veritable plague of operational problems. But the only thing we can do is buckle down and "take it." It's the price of the good years, the freedom and prosperity which has been our heritage as Americans.

Let us remember that our responsibilities in this twilight zone of peace extend beyond the necessity for tighter, more efficient operation of our facilities. The human values—the civic responsibilities—cannot be set aside, no matter how urgent the other demands on our time and attention. In a democratic form of government, you can't let George—or Joe—do it, if you want to stay in business as a democracy. None of the facets of the problem are new to you. But they bear frequent repetition because they are important. They must be kept constantly in mind.

First of all, we've got to "perform miracles" to fill the gap in our country's defenses. It's every man's job, and we must band together in solving the production problems and where possible adopt more efficient distribution methods.

And while we're forging the sword for war, we must keep one hand on the plow and pray for peace. It's both "guns and butter" in this case. Stabilizing the economy by leveling out the flow of goods from American assembly lines will be a backbreaking job. We are proud to think we in this industry will be given a man-sized job to handle.

Finally, the internal security of the country—which is **also** the business of every businessman—can't be neglected. The men we select to hold the reins of government become either assets of whom we can be proud, or liabilities whose selection we may learn to regret. In any case, the credit

J. L. Gagini, Omaha, Neb.
Vice-president, American Warehousemen's Association

or the blame is ours because we elected them. We as citizens must rise or fall by our own acceptance or rejection of civic responsibility—which goes on regardless of the status of our affairs. It's a time for more activity in the field of civics. A time for greater attention to the selection and direction of the public servants who hold the reins and guide our country's affairs in this emergency.

We face both a challenge and an opportunity in the job before us. If we fail, a spiritual dark age will settle over the world which will rival the

Retiring A.W.A. President Horace Wilson congratulates successor J. Leo Cooke at closing ceremonies of 60th annual convention.

plagues of the middle ages in its devastating effect on civilization. If we succeed—and I say, with every true American, that we must succeed—the dream of a world of peace, personal freedom and equality of opportunity will be closer to realization than at any moment in recorded history.

Fundamentals in American Way of Life

"Four of a Kind" was the subject of an inspirational address by Warren Whitney, vice president, James B. Clow & Sons, Birmingham, Ala. The four fundamentals in the American way of life, to which his title referred, are freedom of religion, freedom to pursue and use knowledge, the right to work and take gains from work, and the opportunity that is created by the presence of these three. As an example of the fundamentals he cited, Mr. Whitney called attention to the origin of his company which was started with $300 worth of borrowed money. Now that some company operates six different plants and about thirty sales offices. Alluding to the confusion apparent in the minds of many people in this country, Mr. Whitney said there is a trend on the part of some people to seek a change in the American way principally for the sake of change.

He called on business leadership to fulfill its repsonsibilities and dissipate this confusion by making the facts known and teaching the whole people about the fundamentals of the American opportunity system. Rising against this system is the desire for security without work and top-heavy administrative government. Subsidies are sought instead of productivity and false economic policies and deficit financing continue. Arbitration replaces cooperation and there is a divorcement from principle. He called for a return to confidence in the system which has given all our people their opportunities and present good life.

Greetings of the Canadian Warehousemen's Association were brought to the meeting by President Crawford Johnson of that association. He told about the similar objectives of the Canadian way of life and the cordial good feeling which existed between his industry associates and their counterparts in the United States.

Warehousing in Defense Effort

"Warehousing in the Defense Effort" was discussed by Harold Osgood, warehousing specialist, Defense Transport Administration, Washington, D. C. Domestic transportation, warehousing and port facilities are the responsibilities of DTA as outlined by Mr. Osgood. Much of the productive resource and the general capacity of the nation depend on these agencies and Mr. Osgood said that storage is the final link in all transport and distribution.

Maximum use of these facilities depends on a central agency to direct their activities, Mr. Osgood stated, and he said DTA desired voluntary participation without direct regulation or control. Good profit, he continued, is being taken from methods developed during the past war and plans are being made on a long range basis. He stated that refrigerated warehouses now have occupancy of 67 percent in coolers and 81 percent in freezers, while many are close to capacity. Frozen food volume for military use will continue to increase. To accommodate needs of the situation, DTA will aid private industry to expand where absolutely necessary, but, for the most part, the required capacity must be found in present facilities.

Local warehouse groups were urged to coordinate their efforts and Mr. Osgood cautioned that manpower problems were increasing so preparations should be made to meet the necessities. Men should be trained to produce at the greatest efficiency of which they are capable, women should be employed to handle such jobs as operation of mechanical equipment. Handicapped workers and those over age should be used as much as possible. In order to make full use of transportation facilities, Mr. Osgood urged all speed in loading and unloading of cars. At the same time, full protection should be continued against fire and other hazards.

Vice president J. Leo Cooke was presented to the meeting. He gave brief, personal greetings and called attention to the primary importance of this sixtieth annual convention. Members were urged to seek ways to give complete cooperation in the war effort.

Director Martin Hudtloff, Transportation and Warehousing Branch of the Production and Marketing Administration, gave a detailed discussion of the operations carried on by this largest customer of refrigerated warehouses. Hiss address is printed elsewhere in this issue.

Final Session

The final session of the convention was designated as the "Mobilization Session" because it dealt with key factors and problems in the present emergency.

Fundamental factors in the mobilization were described by Rear Admiral Morton Ring, USN, director of Supply Management, Munitions Board. The present effort, he said, is not geared to all out war, but it does pose a number of difficult problems since it must be based upon an already expanded economy.

He went on to describe the functions of the Munitions Board which rationalizes stated needs of the various armed services and seeks to fulfill fundamental requirements. Accurate facts are required to carry out these objectives and the need for good data on storage space available is therefore evident. Through accurate

facts and a full utilization of present facilities, Admiral Ring said, it will be possible to avoid construction of special facilities.

Full integration is contemplated of military and civilian activities to the end that national defense objectives will be fulfilled. Admiral Ring assured his audience there is no real opposition to unification among the various services and it is expected that complete coordination will be obtained. He urged the industry to support its advisory committee and pledged that federal practices would make full use of the facilities available on an efficient basis.

International Situation

The present international situation and the future course of events were analyzed by Erwin Canham, editor, Christian Science Monitor. The present situation in Korea was described as giving us a very good grip on the bear's tail. The immediate situation looks fine, Mr. Canham added, but on the long range view, it is not so optimistic. An exact evaluation, he said, shows that the present struggle is not one between communism and democracy, but rather it is a conflict between the all-powerful state and the system which puts human values first. His views on the immediate prospect for war were hopeful and he based this on the faet that Russia is not ready for war. They have numerous shortages in vital requirements and especially in supply of petroleum. Moreover the Communists are doing all right in one political field at the present time so why should they take the ultimate chance.

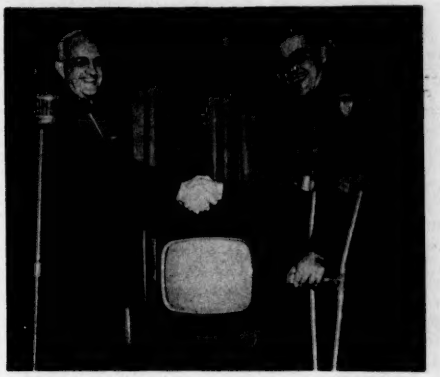
Fruits of Socialism

Mr. Canham attacked the basic concepts of socialism as enunciated by Marx and Frederick Engels that "the workers had nothing to lose but their chains." "Look," he said, "at the workers behind the iron curtain and in the democratic countries. Which group is in chains and which group is largely enjoying the fruits of its own labors? Which group has freedom of expression and liberty and which group lives in fear and suppression?" The present struggle, Mr. Canham said, goes back thousands of years because the all-powerful state has always fought and sought to suppress free men. He counted on the free men to win out as they have in the past. At the same time, he counselled that we should credit the overseas sources of our ideals and system and cooperate with all people of good will to meet the threat to these ideals.

The Man of the Year

THE real Man of the Year is the American Infantryman. That is the decision of the American Warehousemen's Association, which was announced at the 60th Annual Dinner. As evidence of appreciation to the men who have carried the burden of war on their individual shoulders, the Association presented a television set to the veterans at Murphy General Hospital, Boston.

As representative of the combat veterans, Pfc. James Connors received the award. A member of the 11th Airborne Division, he served in Korea and was wounded during the attack on Suwon late last year.



AWA President Horace W. Wilson makes first annual Man of the Year Award to Pfc. James Connors ex-paratrooper wounded in Korean fighting.

The first annual award was made by President Horace Wilson, who represented the industry, in thanking the men of the infantry through Private Connors. He responded with appreciation for the men at Murphy Hospital who will enjoy the TV set while they progress toward recovery.

The report of the association's financial operations was given by general treasurer, W. A. Morse, and was accepted by the convention. The report of the general banking committee was distributed in printed form and additional information about committee operations was presented by C. J. LaMothe, general chairman. He described the excellent acceptance of the promotional pamphlet "Warehouse Receipts" by the bankers. Fifteen thousand of these booklets had been distributed. The members were urged to continue distribution of this material and also to make personal follow-ups in their own community.

The report of the Resolutions Committee followed and it was unanimously adopted by the association. Then the nominating committee made its report. The new officers were elected unanimously in accordance with the committee report.

Retiring president Wilson congratulated J. Leo Cooke, the new president, and said he anticipated an excellent year under his administration. Mr. Cooke accepted the responsibilities in the name of the new officers and thanked the association for honoring him in this manner. He said that both merchandise and refrigerated warehousemen were prepared to meet the public's needs, but he emphasized particularly the neces-

(Continued on page 62)

A.W.A. Men Are Taken for a Ride

C. J. Grimley, 60th Annual AWA Convention Chairman; William Dalton, AWA General Secretary; and Sherman Whipple, Jr., Massachusetts warehouseman, pose with 1915 Lancia limousine used as official car for warehousemen's annual meeting.

Refrigeration Equipment Availability

Scarcity of parts and new equipment are beginning to be evident and to meet controls and allocations, industry will need to sell its essentiality to government agencies

FRED W. SMITH
President Baker Refrigeration Corp.
South Windham, Me.

IT IS a pleasure to be here today and to discuss some of our mutual problems with this organization, which represents one of our most important customers. Your Secretary has given me the subject "Refrigeration Equipment Today and Tomorrow". I want to go on record right now that I am not a refrigeration engineer and I know that many of you know far more about cold storage systems than I do. Therefore, I am not going to presume upon your good nature to attempt to tell you about "Refrigeration Equipment Design of Today or Tomorrow". On the contrary I think you are more interested in "Refrigeration Equipment Availability—Today and Tomorrow", for that is a subject which is uppermost in all of our minds with the increasing extent of government controls.

With respect to maintenance and repair parts for existing equipment, I believe our industry is in reasonably-good shape at the moment, with the possible exception of copper and steel pipe and of course motors. Unless, however, some sort of priority relief is set up by the government in the very near future for maintenance and repair items this situation could change very quickly. I believe it is quite probable however that some sort of a priority assistance order for MRO will be issued by the National Production Authority in the not too distant future.

With respect to new equipment for expansion, alterations and replacement, I believe it is reasonable to say that our industry in general has a backlog of orders ranging from three to five months depending on the size or type of product. Now the cause for this period of backlog is not because of our inability to produce more compressors, condensers and other accessories, but because of the ever lengthening lead time on raw materials and components. True, our sales have increased in the past six months because many people have been anticipating future needs but we could still keep up with this increase if materials and components were readily available. This situation I am sure will get much worse before it gets better.

Presented at annual convention of the National Association of Refrigerated Warehouses.

Outlook for Future

So much for refrigeration equipment today. How about tomorrow? The answer to that depends very largely upon what we as an industry can do to sell the essentiality of refrigeration equipment to various government agencies and what you and other consumer industries can do to convince government agencies that refrigeration equipment is one of the life lines of your own industry.

Nine years ago in the early days of OPM and WPB we got kicked around pitifully at the hands of the government career boys and the long haired economists. I can speak from personal experience because I got into the act in Washington from the Spring of 1942 until the Fall of 1944. Nine years ago when the first priority system was set up, industrial refrigeration equipment upon which you depend for the operation of your business was classified with consumer durable goods and small household appliances, most of which had already been prohibited by limitation orders. At that time also most of the men who were processing your priority applications had absolutely no conception of your problems or ours.

As a typical example I recall an instance where one of these analysts had a worthy priority application for a 50-ton ice plant. He excitedly commented to some of his associates, "Did you know that there is a company up in Pennsylvania that makes an ice box that weighs 50 tons?" I ask you, gentlemen, do you want that kind of an individual passing on your requests for assistance?

It could happen again, but I am optimistic enough to doubt it. Nine years ago our industry was disorganized, divided into a half a dozen or more segments each of which was promoting its own angles without regard for the other segments. Because we were disorganized we were unable to enlist proper support and cooperation from the powerful user industries such as your organization and others. Today the picture is different—we are a unified industry representing close to three-quarters of a billion dollar annual volume. Our three trade associations are already cooperating with consumer trade associations such as yours.

Last July the Air Conditioning and Refrigerating Machinery Association appointed a "Government Requirements Committee" of which I happen to be chairman. The objective of this committee was to keep the various agencies of the government informed as to our products, their uses, their essentiality, and the ability and facilities of our industry to contribute to the overall defense effort. We asked the Refrigeration Equipment Manufacturers Association and the Commercial Refrigerator Manufacturer's Association to join with us and that they have wholeheartedly done.

Brochure Describes Essential Uses

We have cooperated in the publication of an illustrated industry brochure of some 40 pages describing the essential uses of our equipment both in the civilian and military economy. Fourteen pages of this brochure are devoted to the part refrigeration plays in the processing, transportation, storage, and distribution of the 180 million tons of food to feed this country's million inhabitants and its military forces at home and overseas.

This brochure emphasizes the fact that during the past sixty years, the development and use of refrigeration as a food preserver have revolutionized food processing methods and established a new pattern of food production and distribution. The eating habits and health of the nation are now dependent on a long chain leading from farms and fisheries to refrigerated and air conditioned food processing plants—refrigerated warehouses, refrigerated railroad cars and trucks, refrigerated terminals and markets, the millions of refrigerated units in retail food stores and finally to the household refrigerator. Without refrigeration, great areas devoted to highly specialized crops would not be developed and the present agri-

cultural picture of the country would be greatly changed.

It emphasizes the fact that the cold storage warehouse industry is a vital link in the long chain of distribution from food producer to the consumer. Throughout the nation there are approximately 1850 refrigerated warehouses having over 700 million cubic feet of space. As of January first a year ago these warehouses held:

431 million lbs. of dairy products
167 million lbs. of fish
1,737 million lbs. of fruits
1,100 million lbs. of meats and poultry
600 million lbs. of vegetables

This huge reservoir provided by the cold storage warehouse industry is indispensable to keep food supply and demand in reasonable balance avoiding seasonal market gluts and scarcities.

Besides emphasizing the importance of refrigeration in the chain of food distribution, we also stress its importance in public health, hospitals, industrial applications in the metals, aircraft, automotive, electrical, chemical, textile, pharmaceutical, plastic, and many other industries. In addition we devote six pages to the military uses of refrigeration on land, at sea, and in the air.

This brochure will be distributed to key individuals in:

Congress
Office of Defense Mobilization
Munitions Board and Department of Defense
National Production Authority
Agriculture
Interior
Defense Transportation
Labor

Tell Story to Key People

I have been told that your organization has taken similar steps to get the story of your dependence on refrigeration in the hands of similar people. I congratulate you on this far sighted move as it is that type of team work that will solve some of our mutual problems. Certainly if these two stories can be sold to the key people in the aforementioned agencies, we shouldn't be pigeonholed with household appliances.

As to manpower and personnel in government we are also trying to do something about that. Three months ago we requested from the NPA that an Industry Advisory Committee be formed and with that request suggested the names of industry executives to make up that committee. The committee was formed with most of our recommendations being followed and one meeting has already been held on January 19, 1951.

We have also submitted to NPA a panel of competent individuals whom various companies in our industry have agreed to make available for various administrative jobs within the section.

In my opinion, the time is not far off when some system of priorities will be set up to grant assistance to the more essential civilian requirements. The better understanding the government has of the essentiality of refrigeration and your dependence on refrigeration, the better will be your priority. After a year or more of constant hard struggle in the last WPB we finally got a reasonably good rating established for food processing and storage equipment. I hope it won't take us that long this time.

In my opinion also, the time is not far off when we as manufacturers will be under a controlled materials plan of allocation and there again we will need your help. It behooves your industry then to get your claimant agency whom I presume will be Defense Transportation, Agriculture or both to substantiate our request for materials in your behalf.

To summarize and make a prediction on the future, if you will carry your story and other user industries will do likewise and we carry our story to all interested people in government, I believe we will be able to carry out our respective parts in the defense mobilization without asking for more than our just share and without undue hardships.

Emergency Plans for Refrigerated Warehouses

FUTURE planning of the refrigerated warehousing industry is predicated on the possibility of abnormal demands for the storage of perishable food products resulting in critical shortages of space. Presently, there is a nation-wide surplus of cold storage space. Plants and facilities are considerably in excess of normal storage requirements—governmental and civilian.

Planning ahead for an extraordinary situation should basically involve, in their order of importance:

1. Meeting the storage requirements of the Armed Forces and other Government agencies.
2. Provision for the needs of the civilian population.
3. An equitable division of the additional burden among all of the warehouses throughout the Nation.
4. Full cooperation with the Government in administration of wartime controls and effort to secure for the industry adequate priorities to fulfill its obligations under this planning program.

To effectuate these objectives it is recommended that the refrigerated warehousing industry assure 25 percent of the total commercial refrigerated space in the United States to the Government on request at such time as space may be critical. This percentage of the total commercial space would approximate 1,500,000,000 pounds of food products. To insure orderly and efficient operation of this assurance, the following procedures are suggested:

From the report and recommendations based on two years' work by the Committee on Emergency Plans, National Association Refrigerated Warehouses.

Operation Procedure

1. Upon request of the Government a warehouseman would be obligated to provide a maximum of 25 percent of the space in each warehouse under his control. The 25 percent shall be presumed to include products already in storage for the account of the Government, and also commodities placed in storage by vendors for transfer to the Government in the immediate future. In no manner, however, shall individual warehouses be prevented from accepting in excess of this maximum in their individual discretion.

2. Government agencies shall advise a warehouse thirty days in advance of their requirements, thereby permitting the warehouseman, by regulation of civilian receipts, to create the requested space. Increments of Government storage shall be on a reasonable basis.

3. It is suggested that in order to partially compensate the warehouseman for revenues lost in the creation of space, the Government might properly offer an equitable guaranty to the warehouseman. A proposal from the Government in this premise may include a working formula of this nature:

The Government may, from time to time, specify the amount of tonnage requirements to be allocated for its purposes by 30 days advance notice to a warehouse concerned. Warehouse capacities so reserved for the

tonnage specified would be held for the use of the Government until, and again on 30 days notice, increased, decreased, or cancelled as a whole. In consideration of this reservation, the Government would guarantee to the warehouse x cents per hundred pounds for cooler space and x cents per hundred pounds for freezer space on the basis of the Government's maximum tonnage reservation for each 30-day period after the effective date of the initial allocation. This minimum guarantee would terminate at the expiration of the 30-day notice of reduction or cancellation of reserved capacities. (See suggested Supplement to Tariff.)

Warehouse Charges

Each warehouseman shall charge the Government for his services according to his individual tariff, crediting to the Government's guaranty all revenue collected from storage—but not from other services such as handling, freezing, etc.

Good faith on the part of the warehouseman shall be the determining factor should the warehouseman fail in performance. An incident of a lack of good faith would be the negligence of a warehouseman in limiting warehouse receipt of products of civilians after demand of the Government for space. The warehouseman would be subjected to a penalty where requested space was not made available to the Government after due notice and a lack of good faith was evident. Such penalty might be an assessment to the warehouseman of any additional cost to the Government for movement of the refused product to the nearest available warehouse.

Mutual Cooperation

It is the hope of the cold storage warehousing industry that in undertaking its obligation to serve the Government in the preservation of perishable commodities, due consideration may be extended by the Government to the industry in emergency planning and administration. Such consideration should include priorities on materials for maintenance of the plant; priorities on materials handling equipment including spare parts and items required for operation, such as batteries and tires; priorities on materials for new construction necessitated by Government requirements; deferments on manpower to efficiently perform the duties required, including labor, mechanics and managerial personnel; direction of refrigerated warehousing through centralized administration as distinguished from multiple agencies; a working and workable industry advisory committee; and other items of import.

It is contemplated that this is purely preliminary planning, subject at all times to expansion and adjustment as occasion may require.

The following supplement to tariff has been suggested:

Supplement to Tariff
..... Company

IN A PERIOD of national emergency and of critical shortages of refrigerated warehousing space, this company (hereinafter designated as the "contractor") agrees to extend preferences to agencies and departments of the Federal Government (hereinafter designated as the "Government") to meet their requirements for the storage of perishable food products.

Upon request of the Government the contractor shall be obligated to set aside and provide for storage in each warehouse under its control for the use of the Government a maximum of 25 percent of its total refrigerated space as measured in averaged poundage capacity. This 25 percent allocation of space to the Government shall include commodities already in storage for the account of the Government and also commodities placed in storage by vendors for transfer to the Government in the immediate future.

To effectuate the objectives intended, the Government shall from time to time inform the contractor by 30 days advance notice of its storage requirements in approximate pounds, and request the contractor to allocate and reserve for its use the space necessary to meet the anticipated requirements. Warehouse capacity so allocated and reserved for the tonnage specified will be held and/or utilized by the contractor for the Government until, and again on 30 days notice, increased, decreased or cancelled as a whole.

For the storage and handling of products and other services rendered by the Contractor under any reservation and allocation of space, the Government shall compensate the Contractor in accordance with the rates and charges indicated in the tariff attached to the Government's contract marked "Exhibit A." The Government shall guarantee to the contractor ..... cents per one hundred pounds of product in cooler space reserved, and ..... cents per one hundred pounds of product in freezer space reserved on the basis of the Government's maximum tonnage reservation for each 30 day period after the initial date of storage indicated by the 30 day advance reservation. This minimum guarantee shall terminate at the expiration of a 30 day notice of reduction or cancellation of the specified reserved capacities. The contractor shall credit the Government's guarantee with all revenue earned by the contractor from the storage and only storage of commodities received and stored in accordance with each particular reservation. No credit shall be given to the Government on its guarantee on revenue earned from other services such as handling, freezing and similar services involving labor and material. In no event shall the guarantee of the Government become operative unless and until at the date of the making of a reservation the particular warehouse where space is demanded shall have been to all practical purposes unable to meet the Government's indicated future requirements thereby necessitating limitations in the use of the contractor's refrigerated space by the civilian or trade customers.

Increments of storage by the Government as they relate to reserved space shall be on a reasonable basis in order to insure that the contractor may receive Goverment products efficiently in its normal manner of operation.

Provided the contractor has acted in good faith there shall be no penalty imposed should the contractor fail to meet its reservation obligation to the Government under this supplement to contractor's tariff. Where a lack of good faith is evident, the Government may in its discretion assess to the contractor any additional costs incurred by the Government for shipment of the refused product to the nearest available refrigerated warehouse.

Pamphlet Describes NPA Regulations

THE National Production Authority (NPA) was established in the United States Department of Commerce on September 11, 1950, to assist the Secretary of Commerce in carrying out certain of the functions in the Defense Production Act of 1950 limiting the quantities of materials in short supply that can be ordered, received, or delivered and NPA Regulation 2, effective October 3, 1950, establishing a broad system of priorities assuring the right of way to defense orders with minimum disruption of production schedules and civilian supply.

A pamphlet has been issued designed to answer those questions most frequently asked of the NPA with respect to the application of NPA regulations to industry and business. While these are accurate answers to general questions, it is explained, they should not be considered as legal interpretations applicable to specific cases. For more specific guidance, inquiries should be directed to the nearest field office.

Refrigerated Warehouses Are Ready

NARW 1951 Convention Plans Work in National Emergency

CRITICAL times make this a most important convention and the industry is ready to fulfill its responsibilities in the national emergency. Thus President J. L. Gagini, gave the keynote of the annual convention of the National Association of Refrigerated Warehouses held in Boston on February 6, 7, 8. The meetings were held in the Statler Hotel where a really large group of members had overcome transportation problems to attend.

Jerry P. Johnson, Washington, D.C.

President, National Association of Refrigerated Warehouses

For excellent accomplishments during the challenging year before, President Gagini conveyed the appreciation of the association to the other officers and staff. All of them he said, had given cordial and complete cooperation in all fields of endeavor. The industry is to be complimented for having and maintaining such an effective association Mr. Gagini stated.

Public Relations

The growing problems of operation and public relations in industry took first place in the convention program. Methods and results in this field were described by Milton Fairman, Director of Public Relations, Borden Company, New York City. The national community, Mr. Fairman said is on edge because of economic problems, hysteria and governmental troubles Because the public is under pressure it seeks a scapegoat and business should guard against being placed in that role. This fact should be kept in mind although there are numerous problems ahead in connection with manpower and other factors.

NARW Officers for 1951

President — Jerry P. Johnson, Washington, D. C.

Vice-president—A. B. Efroymson, Cleveland, Ohio

Treasurer—C. E. Simmon, Oklahoma City, Okla.

Executive Vice-president—William Dalton, Washington, D. C.

Secretary — Joseph Colquitt, Washington, D. C.

New Members, Executive Committee: W. C. Hudlow, Chattanooga, Tenn.; F. D. Newell, Jr., Minneapolis, Minn.; R. M. Conner, Chicago, Ill.; Wayne Wilson, Brooklyn, N. Y.

In order to minimize manpower difficulties, Mr. Fairman said, working conditions should be made attractive to hold present employees. Channels of communication should always be kept open between management and its own workers. They should be given the facts about the business because general ideas do not count for very much. Examples were given of how morale and production are increased and satisfaction of the employees is enhanced by making workers aware of their importance in company operations. The same general idea, Mr. Fairman said is applicable to general public and customer relations. Shortages and inability to serve customers in the usual way should be fully explained to them.

The importance of trade associations was emphasized by Mr. Fairman. They deliver information quickly to members and are in best position to foster good government relations and reduce friction under controls. The association and its members can contribute much of value during the coming months for the good of every one. Controls will be better handled this time and with sympathetic understanding. More business men can enter into the control organization. There will be much for everyone to do in allaying fears and hysteria. In conclusion Mr. Fairman also pointed out that business men will be called upon to share sacrifices and not count on gaining too much during the present emergency.

Meeting the Emergency

The NARW Committee on Emergency Plans took over for an informal, specific discussion of the fundamental problems of "Refrigerated Warehousing in a Defense Economy." Chairman Vallee Appel of the committee was leader of the panel. The primary objective of the activity, he said, was to get the industry job done and he cautioned against giving way to excessive worries. Fortunately the committee is now completing two years work in close cooperation with government agencies, and Mr. Appel stated that better plans and results should be accomplished than during the last war.

The government depends upon public refrigerated warehouses, Mr. Appel said, and has few of its own. It is the responsibility of the industry to fulfill its obligations and give full cooperation during the present emergency. The government has the power to take over present facilities or build its own. The government realizes, Mr. Appel continued, what is involved in carrying the necessary program on through facilities operated by private industry. He reviewed the suggested plans developed by the committee in cooperation with government agencies and the effectiveness of the work was borne out in the specific statements of the government men on the panel. (A more complete statement of the committee plans and suggestions is printed on the opposite page.)

Munitions Board

The functions of the Munitions Board were described by Lt. Col. Walter Mearls, chief of the Storage Division of that agency. The Munitions Board is the coordinating agency for all the services including army, navy, air force and Col. Mearls described the work with the NARW

Committee to avoid competition for space and prevent holding of unused space in refrigerated warehouses. All matters of perishables are centralized in the Department of the Army, he said, and the operations promise to be much better for all concerned than they were during the last war. Early steps have been taken to prevent confusion and have all facilities better utilized. Col. Mearls described the proposed contractural relationship with refrigerating warehouses now being set up and added that no direct leasing of space is complicated.

The next speaker was Col. Kearney who detailed the operations of the Quartermaster Market System as they relate to refrigerated warehouses.

Cold Storage Requirements by Military

COL. C. F. KEARNEY
Chief, Quartermaster Market Center System
Chicago, Ill.

THIS meeting has been scheduled during a period of grave concern and national emergency. It gives me the opportunity to tell you something about that all important supply, "Perishable Food for the Armed Forces."

The market center system is organized for the purpose of purchasing, storing and distributing perishable subsistence for the army, navy, air force, marine corps, coast guard, and other Government Agencies. To illustrate the scope of this operation, this task involved the spending of approximately 55 million dollars for procurement per month.

Due to the emergency expansion of the Armed Forces which developed in 1940, reports from various sections of the country indicated a serious and dangerous dislocation of subsistence markets as a result of military concentration and movements. In many areas of the United States there were military installations with from forty to eighty thousand men. In order to cope with problems incident to the supply and transfer of perishable foods for such a tremendous number of men, the quartermaster market center system was established.

The system evolved was patterned after existing chain store organizations, and was developed with the objectives in mind that: (1) The methods employed must embody all legal requirements incidental to Government contracts: (2) The procedures must follow generally accepted commercial business practice: and (3) The system must be capable of attaining maximum expansion during a period of emergency.

Procurement Operations

The market center system began actual procurement operations of fresh fruits and vegetables for army posts, camps and stations in April 1941. Gradually, as Navy, Marine Corps and Air Force installations experienced difficulty in procuring adequate supplies of good quality, permission was sought by them to secure their perishables through the market centers.

From the beginning, it was planned to activate market centers in such cities as would serve the dual purpose of attending to the requirements of locally situated posts, camps and stations, and purchasing any surplus production of perishables in the area, which could be distributed to other sections when a shortage of such items existed.

Sound Principle

Our experience with single-service procurement of perishable subsistence has demonstrated the soundness of the principle. It has resulted in an equitable geographical distribution; it has eliminated duplication of effort and lowered overhead expense; it has offered the broadest participation to producers and vendors in Government business; and it has supplied the services with foods of uniformly high quality at less cost.

The headquarters of the system is in Chicago, Ill. At present, there are ten market centers plus additional field buying offices strategically located throughout the country. Market centers are located in those areas which have the greatest potential capacity to grow, breed, raise, pack or process perishable subsistence.

Dealing with us is not complicated. It is a matter of understanding certain simple well established rules and regulations.

The market center system has storage and distribution divisions which are engaged in warehousing, accounting and transportation activities. The production of most perishables fluctuates seasonally, while the consumption of the Armed Forces remain fairly constant the year round. Because of this situation, we have deemed it advisable to store certain items during seasons of high production and low prices for issue during seasons of low production and high prices, the storage life of all items being considered. We know that the savings by purchasing in carlot usually far exceeds the cost of storage charges, handling in and out and the cost of transportation.

Requirements to be Prorated

Every effort will be made to avoid the injustices which some members of your industry suffered as a result of the rapid and extensive increases in the use of perishables during World War II. Our objectives are to plan operations on a cooperative basis with all members of the Refrigerated Warehousing Industry. I think by mutual participation the Armed forces will obtain their requirements for cold storage facilities with the minimum disruption to the civilian economy. We will make every effort to prorate requirements consistant with all factors concerned including origin and ultimate destination of product, transportation and transit privileges. It should be pointed out the percentage of freezer and chill facilities required will vary according to location and supply needs. We will, however, make every possible effort to equalize these requirements.

Space Required

Our initial planning indicates that cold storage requirements for the Armed Forces will, if proportions of World War II are reached, approximate 16 to 20 percent of the freezer space and approximately 8 to 10 of the cooler space of public refrigerated warehouses. All cold storage space and services known to the industry are recorded by area, city and individual warehouse. In the planning of a stock piling program, each market center is assigned a portion of the total program consistent with the space available. Each warehouse in the given market center area will be assigned a prorated share of this burden. From then on it is a question of 100 percent cooperation because, if each facility does not accept its share of the responsibility of the total national commitment, an additional amount must be carried by your fellow warehousemen.

Completely Prepared

Our procurement load already has doubled since our troops landed in Korea. However, our organization is so constituted and geared that it can readily be expanded to meet additional needs. All we know is that we have a tough—a very tough—fight on our hands. We know, too, that there are forces in the world able to make it even tougher for us, if they so decide. One of the fundamental principles by which all military men are guided is: "Never underestimate the strength or the intentions of the enemy." We must apply that principle today. As a peace-loving democracy we must continue to hope for the best. At the same time we must prepare for the worst. We must maintain high flexibility in our planning, so that our procedures may readily and effectively be altered to meet changing conditions. We must continue to streamline our methods so that speed-ups—so valuable when the going gets tough—can be applied wherever and whenever needed.

Operating Details Dept. of Agriculture

Further details of the operations of the U. S. Department of Agriculture in connection with refrigerated warehousing were given by Martin Hudtloff, Director Transportation and Warehousing whose principal address is given under the AWA meeting report.

The assistance to be furnished the industry by the Defense Transport Administration was explained by Harold K. Osgood, Storage Specialist. The work, he said, has been set up in three divisions: materials procurement, manpower, facilities. The DTA, he said, expects and prefers voluntary participation and cooperation in emergency activities. Certificate of Necessity applications which permit more accelerated amortization of facilities provided to serve in the emergency will pass through DTA. They will receive sympathetic treatment wherever the conditions justify because Mr. Osgood expressed the opinion that freezer space at present looks short.

The advances in storage techniques fostered by the Refrigeration Research Foundation, Mr. Osgood said would aid in accomplishing better results and he complimented the industry for the effective job NARW has been doing in cooperation with Washington agencies.

Second Session

Signal honors were accorded George A. Horne and Ralph C. Stokell, when by unanimous vote they were elected honorary members of NARW. Through unfortunate circumstance, neither of the two industry leaders were able to receive their honors in person. Dr. Mary Pennington reviewed the scientific attainments of Mr. Horne and detailed the valuable work he has done in the industry. President J. L. Gagini told of the direct work Mr. Stokell has done in the association and the place he made for himself in the industry.

The financial affairs of the association were analyzed in a report by Treasurer William Moore of New Orleans who read a detailed statement of the income and expense during the past year. The report of the Nominating Committee was presented by Millard Young, Chairman, San Francisco. The recommendations for new members of the Executive Committee were adopted and the nominees elected by unanimous vote.

Group life insurance furnishes an important aid to industry in meeting the present problem of holding good employees. This and other benefits of group insurance were described by H. Cochran Fisher, CLU, Washington, D.C. Attractive working conditions, he said, will be of increasing value to meet acute manpower problems developing for the future.

Warehouse Operation by Private Industry Preferred

Does the U. S. Government contemplate taking over and operating the Bronx Terminal cold storage plant at New York, was a question directed at Martin Hudtloff, P. & M. A., U.S. Department of Agriculture. He replied that the government has no desire to operate storage space. If this particular warehouse is needed, Mr. Hudtloff said, it is the desire of his organization that the industry will operate it. This attitude, he continued, applies to all the warehouse space needed during the present emergency and throughout the foreseeable future.

A good program of group insurance is available through the association. It permits every member regardless of the number of employees to provide group insurance for its personnel. Mr. Fisher read a number of letters from association members who endorsed the group insurance program and described its value to them. Until May, Mr. Fisher said, additional member companies can cover their employees without medical examination. He urged prompt consideration by those not now participating and pointed out that group insurance premiums are deductible in figuring income taxes.

Refrigerating Equipment

The present situation in regard to refrigerating equipment was analyzed by Fred W. Smith, President Baker Refrigeration Corp., and a representative of the refrigerating machinery group on the NPA Industry Advisory Committee. His report is printed in this issue.

The national legislative picture was analyzed by Jerry Johnson, director of the committee, Washington, D. C. He had submitted a detailed report describing the comprehensive activity in connection with numerous legislative proposals affecting the industry and business in general. Specific analysis was made of a large number of bills and Mr. Johnson urged all members make their views known to their legislative representatives on all pending enactments. This, he said, would be a much appreciated cooperation with his committee.

At the conclusion of his report Mr. Johnson was given a unanimous vote of appreciation for the ability and the initiative demonstrated in this important work.

Warehousing Receipts and Warehousing Law

Printed reports were furnished by the committee on Warehousing Receipts and Warehousing Law and the Committee on Space Occupancy Report to USDA. Chairman Earle Hesse conserved time by presenting a consecutive discussion of these two reports. Vigilance, he said, is necessary to counter legislation sometimes proposed by people who do not fully understand the situation in public warehousing operations. He alluded to a suggested bill to prevent release of goods without return of the warehouse receipt whether negotiable or not and said it had been successfully opposed.

The confusion in gathering of statistics on refrigerated warehouse commodities was described by Mr. Hesse. He said an attempt is being made to lump reports of holdings in both public and private warehouses which is misleading. In his view a review of the whole system is needed because the Department of Agriculture report on cold storage holdings has reflected inaccuracies. Misuse of the data has resulted in figures on density which are in error and do not reflect the efficient use actually being made of public cold storage space. The convention, at the conclusion of Mr. Hesse's report gave him a special vote of thanks for his work in these two important fields.

Third Session

"A New Approach to Warehousemen's Legal Liability Insurance" was described by Charles Sise, North America Companies, Philadelphia. He complimented the industry on its good fire loss record and urged continuing precautions in order to benefit from this low loss ratio. In the past he said, there have been differences of opinion among insurance compaines in regard to warehousemen's legal liability coverage.

Multiple policies have usually been

required to cover legal liability. It has been the desire of his company, he said, to set up insurance providing adequate coverage at equitable rates in simple form. To this end cooperative work was started some time ago with the industry. Industry desires, he said, basically are to cover castastrophe losses while smaller losses are carried by the insured. The majority wanted insurance with a limit of $150,000 to $200,000 with a deductible amount of about $1,000.

A proposed policy to meet the desires of the industry has been set up by his company, Mr. Sise announced. It has been filed for approval with the State Insurance Departments and 32 of them have already acted favorably. He went on to describe detail features of the insurance coverage. These will include inspection of plants by experts to reduce loss hazards, legal defense in case of claims and payment of losses where liabilities are assessed. The policy is broad and simple. There are only three exclusions: contractural liability, money and securities, and losses discovered more than one year after lapse of policy.

Trends in Frozen Foods

Important developments and storage and distribution of frozen foods were the subject of intensive analysis and discussion by a large group of experts. Ample time was provided to dig into the subject and that is just what everyone did under the leadership of Harlan Nissen, Los Angeles who acted as moderator. Original participants were two frozen food distributors and two packers of frozen foods. Later they were joined by two warehousemen and in additions others participated.

Mr. Nissen presented the first four speakers as the most important people in the convention—customers of the industry. They also represent he said, the most rapidly growing division of the food industries with annual volume which has rapidly grown to a million pounds. He emphasized the identity of interests among frozen food and warehouse people and bespoke cordial cooperation between the two groups. Some problems he acknowledged have developed during the transition period of the industry, but they have not been beyond solution.

Problems of Distributors

The problems of distributors of frozen foods were recounted by Albert Richards, President, Albert W. Richards Co., Boston. He described the functions of a distributor who must sell an adequate volume of frozen foods to keep his business going. At the same time he must promote and develop markets and give complete service to his customers without regard to the difficulties that may be placed in his way. Moreover, Mr. Richards said, the distributor must be ever elert to adopt more efficient methods so that costs can be held at a minimum.

Another problem, he said, has now clouded the future of the frozen food distributors. Goods are being furnished to the retailer by direct sales from the packer by arrangement with the warehouse and trucking agencies. This arrangement effectively bypasses the distributor, and Mr. Richards said it probably would eliminate many services of value formerly performed by the distributor.

The details of a distributor's operations and activities were given forceful exposition by Joseph Gaudio, Gaudio Bros. Inc., Camden. Explaining that he knew the importance of the food distributor, Mr. Gaudio told of his early experience in the grocery field and later as a fresh produce distributor. Since 1941 his company had increased its volume in frozen foods to some 20 million pounds during 1950. This large volume he said was based on selling the best food products with real service to the customer. Because they believe in frozen foods his company has closed out their fresh produce activity built up over 18 years and concentrated on giving real frozen food service.

Now Mr. Gaudio said their competition is not with other distributors

Highlights and Credits

The workers had their coffee in the best Refrigerated Warehouse tradition. The Massachusetts Warehousemen saw to that when they set up a coffee bar in one of the parlors and served all who came in to relax for a moment. Perhaps it also recognized coffee as a new cold stored commodity.

Chris Grimley, Chairman of the General Convention Committee, deserved and received genuine appreciation for the fine way he and his committee handled everything in arrangement and conduct of the affairs for the attendants.

There was a railroad strike—remember? The attractions of the convention overshadowed any deterrent provided by the strike. Many were on trains much longer; some were without food or heat on part of the trip. They were delayed, but they came on to Boston to load up with a store of answers to current problems and those mounting up for the future.

The report of William Dalton, Executive Vice-President, was presented in printed form. It began with an organization chart and then briefed the year's activities and accomplishments in question and answer form. All of it was packed into four mimeo pages, which was quite a job in itself. Don't fail to read the "NARW '50" report.

A chest of sterling silver was presented to President and Mrs. Horace Wilson at the AWA Annual Dinner. It was a gift of genuine appreciation by industry associates. A modest man, whose initiative is accompanied by sincerity and human consideration, President Wilson has made significant contributions to the industry through many years of service.

He kept a discussion going all day and disputing personalities in the Frozen Food industry were still calling each other by their first names. The audience stayed on the job to propose questions and to listen to the informative arguments. It was a good job as Moderator done by Harlan Nissen of (he only mentioned it twice) Los Angeles.

The First Timers' Breakfast is an established tradition that made new attendants better acquainted from the very start. They approved it as a good idea which continues to be a welcome feature of the meetings. First Timers' Breakfasts were held on the second day of the conventions of both NARW and the Merchandise Division, AWA.

Credit Dick Curry, director of information, with fine assistance to the reporters and the numerous other people who came in for convention papers and summaries. He suggested leads on newsworthy phases, and remained cordially cooperative when requests piled up. The meetings received good press coverage.

The Quincy Market Cold Storage and Warehouse Co. held open house at their new Watertown Plant. They transported a large number of visitors on inspection trips to see the original structure and the addition placed in service last summer. Hosts for the occasion were Herbert Farnsworth, Paul Burrill and James Gallery.

Mechanized handling methods were explained by Mr. Gallery who conducted the groups through the storage section and showed how goods are placed and inventoried in accordance with overall pallet diagrams.

The Diesel driven refrigerating equipment under full automatic control was a source of great interest. Numerous questions were directed at Herbert Farnsworth who answered them all. (For further details on the plant see I & R: Jan. 1951 pg. 23 and Sept. 1948, pg. 21)

but with the packer and warehouse. The warehouse, however, is really a partner of the distributor in this field and should seek additional ways to help him. Do not force the distributor, Mr. Gaudio said, to do his own warehousing. It is better he counseled to learn the distributor's problems and needs and cooperate with him to solve them.

Mr. Gaudio described the specialized equipment utilized by his company in its business and said that refinements in operations make it possible for 11 men to assemble from 700 to 1100 orders each working night. In his opinion other methods of supplying the retailer cannot match the distributor set up. Where a warehouse assumes break-up work or other distributor functions it should be careful to keep track of its actual costs of doing the work. It should not be carried at a loss which is charged against storage fuctions.

The spokesmen for the frozen food packers described that side of the picture. The first speaker was Martin Matthews, vice president in charge of sales, Snow Crop Marketers, New York. He said the industry would find no bed of roses in 1951 and recounted numerous problems. The bright side, Mr. Matthews said, outweighs the problems because it is rapidly increasing volume, more home freezer storage space, keener dealer interest and better store equipment. Prices he said are lower than ever before as a reflection of reduced processing costs and better distribution. Meanwhile frozen food quality is high and excellent new specialties are coming on the market.

The future he promised will be good if there is teamwork between packer, distributor and warehouse. He recognized the existence of a problem where a chain organization requests that a warehouse carry on certain distribution functions with the implied threat that this cooperation will be furnished or the retailer will build his own facilities.

Growth of Frozen Foods

The second packer representative was George Mentley, general sales manager, Birds-eye Snider Division, New York City, who prefaced his remarks with data on the growth of frozen foods consumption which has been more rapid in volume increase than any industry except, possibly, television. What the packer desires in frozen foods, he said, is proper temperature protection at all times. Goods must be held at zero F or below without interruption in all steps to the ultimate consumer. Transportation now offers the greatest problem, and truck transport has developed better than the railroads.

Mr. Mentley made a plea for railroad refrigerator cars with mechanical refrigeration which, he said, would reduce costs while many claims would be eliminated and transportation of the goods would be speeded. Mr. Mentley complimented the refrigerated warehouses for the good job they have done in frozen foods but added that better handling and lower costs are a continuing objective.

Warehousemen Complimented

A fine job has been done by the Refrigerated Warehouse Industry in the storage of foods for the Production and Marketing Administration. In some cases, unusually long storage periods were forced upon us by circumstances. The protection and handling given these foods by the warehouses maintained them in good quality.

M. J. Hudtloff, Director
Transportation and Warehousing Branch
P. & M. A., U. S. Dept. of Agriculture

Possibly a new role is developing for the warehouse because all food wholesalers are becoming interested in frozen foods. When they find themselves faced with intricate problems, the wholesalers approach the warehouse to arrange for packing of orders and distribution to stores. A number of warehouses have set up this service. It's a transition activity in which the warehouse has protected its frozen food volume.

Perhaps this arrangement will be expanded if it works out successfully, Mr. Mentley said. The chains, he added, desire to widen their present services to include frozen foods on the same basis as other foods. He added an emphatic caution to guide warehouses through this period. Competition for such deals is not wise. Warehouses should have all the facts before them and the charges for all services should be based on actual costs.

In the general frozen food picture, Mr. Mentley indicated that transit point unloading and loading operations should have more uniform charges and general treatment of the activity. Where a car is partially unloaded the job should be handled with all possible speed and the remaining frozen foods in the car should be re-arranged so that they will carry through the remainder of the journey without damage.

Shirtsleeve Session

The Frozen Food Clinic continued into the afternoon and added two representatives of the refrigerated warehousing industry, Leo Fisher, Harborside Cold Storage, Jersey City, N. J., and F. D. Newell, Jr., The Minneapolis Cold Storage, Minneapolis, Minn. In addition a number of men in the audience participated.

Moderator Harlan Nissen invited frank discussion of developments in frozen food warehousing and distribution. He pointed to the rapidity with which frozen food sales are mounting and forecast that a number of wholesalers or chains would build individual facilities for handling products. This did not mean, he said, that the public warehouse would be by-passed. Some carloads would go directly to the private break-up operation but the bulk of the goods would necessarily be handled in public storages. He cited examples to show how this has actually taken place and pointed out that under these conditions the goods are taken from the public warehouses in good quantity such as 1000 units or multiples of that quantity.

Mr. Newell described frozen food operations in and around the Twin City area and expressed agreement with the ideas enunciated by Mr. Nissen.

"Break-up" by Warehouses

An arrangement where the warehouse does break-up work and assembles orders to be delivered by a contract trucker was described by Mr. Fisher. He told about numerous problems involved in such an operation but these had been minimized by setting up a separate department headed by an experienced man. The department manager had surrounded himself with adequate manpower and the operation had proved successful in that it had satisfied the customer and made an individual profit on the particular operation involved.

Other experiences related by men in the audience did not recite such good results. One warehouseman reported that under pressure from a chain store organization they had undertaken order assembly. The retail stores did not have adequate

facilities to handle frozen foods in proper quantities. This complicated the distribution activity and brought high costs. Also the paper work was voluminous, while it was not possible to maintain good accounting procedures.

A number of representatives from the warehouse and frozen food fields commented on various phases of the the subject. As far as the warehouseman was concerned, it could be summarized in the precautions emphasized by Mr. Gaudio and Mr. Mentley and a number of others: (1) price-cutting competition in this field will benefit no one and least of all the warehouse; (2) no warehouse should step into such service blindly but should plan completely in regard to each detailed function and who is responsible for it; (3) the activities should be set up wholly separate from the warehousing operation; (4) there should be accurate cost accounting and this separate operation should be profitable in itself.

Concurrent Session

Meanwhile during the afternoon a concurrent session had been held. It dealt with insurance, claims, and liability. The chairman of the meeting was E. E. Hesse who later summarized the ground covered in the session at the general meeting convened later in the afternoon.

Emergency Cold Storage Construction

No general construction of refrigerated warehouse plants is contemplated by the Military. Their spokesmen at the Boston meetings described the good coordination of storage requirements for Army, Navy and Air Force at the present time, which will make good use of present cold storage space. Thus, military goods will be well distributed through the country. There may be some need for special handling facilities at shipside, they said, but it is not expected to be great.

Final Session

At the opening of the final session the Federal Trade Commission took over for a public hearing on the proposed Trade Practice Rules for the Public Refrigerated Storage Industry. Printed copies of the rules had been distributed and H. Paul Butz, commission attorney, assumed the chairmanship.

An explanation of the proposed rules and how such matters are administered by the FTC was given by PGad Morehouse, assistant director of the Buerau of Industry Corporation. He reviewed the original Trade Practice Rules adopted by the industry some twenty years ago. He complimented the industry on its observance of the rules and said that no one in the group had made it necessary for the commission to institute proceedings to stop violations. Mr. Morehouse called attention to the change in industry designation to the more logical "public refrigerated storage industry."

A. B. Efroymson, Cleveland, Ohio
Vice-president, National Association Refrigerated Warehouses

The questions from the audience were answered and some suggestions were submitted for minor changes in the proposed rules. With very few exceptions, however, they had general approval of those present at the hearing.

President J. L. Gagini took the chair and the resolutions were read and submitted to the meeting by W. C. Hudlow, Chattanooga, chairman of the committee. The report of the committee was unanimously adopted.

The new officers as previously listed were installed by Mr. Gagini. He expressed good wishes to Jerry Johnson, the new president, and told him he expected an excellent administration under his leadership.

Mr. Johnson thanked Mr. Gagini and the association for the honor conferred and said that he looked forward to a good year in the association affairs.

The call for old and new business showed that there was nothing further to come before the association and the meeting was adjourned.

Clinic on Materials Handling Methods

A MID-DAY session of the NARW Convention Thursday was devoted to materials handling methods and equipment. It was led by James Gallery of the Quincy Market Cold Storage Co. and was preceded by a movie showing the operations in their Watertown warehouse. Mr. Gallery gave suggestions on meeting the needs of the emergency which is rapidly developing and counselled everyone to benefit from the lessons learned during the last war. He suggested mechanization to the greatest extent possible because it raises the men to a semi-skilled level and such men are easier to find. It was emphasized that mechanical equipment does not throw men out of work but it permits them to handle more goods which is the continued objective.

Admittedly, Mr. Gallery said, palletizing requires warehouse space but it is better to expand space and use the equipment; and he called attention to the refinements which have made present-day fork trucks and other appliances more efficient.

He cautioned that equipment should be kept in the best possible condition because it probably will be worked harder and repairs and replacements may not be easy to obtain. Supervisory men should be lined up and trained now so that the plant will be ready to take care of greater volume. Mr. Gallery cited experience of the last war which showed that efficiencies can only be increased and handling improved if the men are properly trained. These trained workers can do much to keep work at a high level and assist in meeting particular problems as they arise. Mr. Gallery concluded with a summary of the basic principles of good materials handling.

In the informal discussion period which followed, many specific problems were presented and numerous suggestions were given toward their solution. It was brought out that hand piling and storage on mechanically handled pallets can be combined to make most effective use of space and speed operations while reducing overall costs.

WAREHOUSE INDUSTRY AND DEFENSE

The refrigerated warehousing industry is in a strategic position to provide service essential to the defense effort. The picture is presented vividly in this article.

M. J. HUDTLOFF
Director, Transportation and Warehousing Production and Marketing Administration United States Department of Agriculture

LAST February when I met with you in Chicago we were concerned with peacetime storage problems, not realizing that within a few months the world would be completely upset. Today we are faced with what appears to be the most critical turning point in our Nation's history. Our position could have been disastrous had we failed to recognize the menace of world-wide communism. Korea opened our eyes, however, and brought to us the realization that this sinister plot to enslave the world must be met head on.

To take such action will require drastic changes in our thinking and planning. Such changes will have a major impact upon all phases of our economy. Our national life will have to be changed considerably and in the interest of national defense we will be forced to get the most out of every action. While hoping for the best we must plan to meet the worst.

The United States Department of Agriculture is right in the middle of the defense effort. As you know, the Department has been assigned the basic food and agricultural responsibilities under the Defense Production Act. Plans are being made to guarantee the necessary food and fiber during this critical emergency. Any action taken by the Department of Agriculture will directly affect the warehousing industry.

Agriculture is fortunate in that its experience during World War II has given it excellent training and a tested organization that is capable of coping with the many problems ahead.

Under the national defense program now getting under way, sufficient reserve stocks of food and fiber will be a necessity, and upon the refrigerated warehousing industry will rest the responsibility of providing the required storage facilities. Warehousing problems are expected to increase, with heavy burdens being placed upon the industry to take care of all the demands that will be made. Full cooperation between the industry and the government was manifest during the last war, and it is anticipated that this cooperation will continue under the present emergency.

Stocks Held by U. S.

When the Red army invaded South Korea last June, the Department of Agriculture held substantial inventories of several agricultural commodities. Stocks of corn totaled 332 million bushels; wheat, 328 million bushels; barley, 31 million bushels; grain sorghums, 41 million hundredweight; dried edible beans, 10 million bags; linseed oil, 472 million pounds; cottonseed oil, 17 million pounds, and cotton, 3,400,000 bales. In addition to these commodities the Department owned considerable quantities of perishable commodities, including 162 million pounds of butter, 59 million pounds of cheese, 363 million pounds of dry milk, and 94 million pounds of dried eggs. These large stocks of commodities were being referred to by some people as burdensome surpluses; but overnight they became vital reserves and are playing an important part at this moment. The 3,400,000 bales of cotton was soon liquidated to meet the increased demand and to fill the gap left by the unusually small 1950 crop.

The Nation's farmers are in a relatively good financial position. They have put a lot of their earnings into up-to-date machinery and equipment. Large reserves of soil fertility have been built up in their soil.

Our farms are in a high state of mechanization, so high in fact, that farmers must have at least the minimum of replacement equipment and parts to successfully maintain their high production goals. There are more than twice as many tractors on American farms as there were in 1941. There are twice as many trucks on farms, nearly three times as many combines, and about three-and-one-half times as many milking machines and mechanical corn pickers.

We have made fine progress in the use of various new improved plant varieties, hybrid seeds, insecticides, and fertilizer, and in better breeding and feeding of livestock. Our farms are much more productive than they were 10 years ago. We are producing 40 percent more food than we were just before World War II. The output per man-hour has risen about 50 percent above the 1935-39 average. With all these advances we find that agriculture is far better able to face the problems and demands of the present crisis than it has ever been in any previous emergency.

Agriculture is making plans to maintain high level production generally with increased production of those commodities in greatest demand. Some will be needed more than others, and the relative demand may change as we get further into the defense effort.

Reserve Stocks Necessary

Sound military planning dictates that we have sufficient reserve stocks of food and fiber. Our allies will be engaged in the production of war materials and many of their men, like ours, will be in the armed forces. Their food needs must also be taken into consideration. What affects one will affect all. With so much at stake we must exercise the utmost ingenuity to obtain record-breaking yields. It is with this thought in mind that we are requesting unlimited production of most major crops.

The course of full-scale production has been taken because we can't take chances with our survival. We must have adequate reserves of all commodities to eliminate the element of chance. We are confident that the American farmer will overcome the difficult problem of increasing production.

Although we can't do anything to guarantee favorable weather, many farmers have power machinery equipped with lights, and other equipment which would enable them to take advantage of even a temporary break in bad weather to put in

Presented at 60th Annual Convention National Association of Refrigerated Warehouses.

or harvest the crop. In the field of food and fibers, weather always plays a major part.

Unfavorable Factors

But if you analyze the situation and compare the possible job we have ahead of us now with what we faced in 1941, there are many striking differences that give us some concern. Some of the comparisons with 1941 are quite favorable. Others, although neither particularly favorable nor unfavorable, pose an entirely different set of circumstances to cope with. A number of other comparisons are distinctly unfavorable.

We can't, for example, mechanize farms now at the same rate as in 1941. Our use of fertilizer is at a record peak now; and in view of the military needs for basic chemicals that go into fertilizer, we can scarcely hope to further increase fertilizer availability as we could in 1941.

One over-all difference is quite apparent. We have nowhere near the slack in our economy today that we had in 1941. Without this slack it becomes all the more difficult to expand. That is true of agriculture, warehousing, industry, labor—all the way across the board.

In 1941, prices of many agricultural commodities were well below parity. This made it possible to stimulate increased production through the upward movement of prices toward parity level. No comparable gap or margin exists today.

Labor Conditions

Labor conditions were favorable in 1941 for the expansion of agricultural production because of the large number of people who were unemployed or who were employed part time. These manpower reserves do not exist today. The expansion of the armed services, the defense industry program, and the possibility of increased foreign aid commitments will result in pressure to draw farm workers into industrial employment. With the present-day level of mechanization of agriculture, skilled workers are required in ever-increasing proportions.

These are just a few of the many problems we are faced with that are of the type that we can control to some extent.

Bad weather is the problem over which we have no control. The best defense against bad weather is ample reserves of storable commodities. Such reserves are necessary for our defense preparation.

The failure to accumulate the reserves that we know will be necessary to overcome the element of chance would be disastrous to our Nation during this emergency. Under these circumstances the Department of Agriculture has no other course than to do everything within its power to assure the abundance of food and fiber for the protection of all concerned.

Cooperation of Warehousemen

This policy will require the close cooperation of the warehousing industry. If possible, all of these commodities will be stored in the facilities of commercial warehouses in line with the Commodity Credit Corporation's warehousing policy. We expect to continue this policy, and as our reserve stocks expand, we are going to call upon you for the necessary facilities, both cold and dry. I should like to ask you this question: "Will you have the facilities available?" With this problem in front of us we must face the facts. As an industry, efficiency in operation is going to be more important than ever before. Coordinated planning and research will be needed by all of us.

You are no doubt familiar with the work of the Department of Agriculture in the last war. We started with certain assignments under the Lend Lease Act which provided for procuring and storing large quantities of commodities.

Work Expands

Following Pearl Harbor, this work was expanded greatly to encompass procurement for all allies of the United States, the armed services, and to some extent for the civilian population. During one period in 1944 procurement reached the huge volume of 7 million dollars worth of commodities per day.

After that war we continued this work for the United Nations Relief and Rehabilitation Administration, the Department of the Army, and the Department of State. Subsequent to those programs we have been busily engaged in other programs, and during the fiscal year 1949, for example, the Department procured 15,000,000 long tons of food, primarily for the Economic Cooperation Administration, the Defense Department, and cash-paying foreign governments. In addition to handling, storing, and transporting these commodities to port position, we are arranging for ocean transportation for commodities destined to our allies throughout the world.

We are presently engaged in several defense programs of this kind, and others are developing at an increasingly fast pace. In fact, the entire pattern established during World War II seems to be repeating itself.

As this defense program continues our warehousing problems will greatly increase. No one can foresee just what the full impact of the defense effort will have on the warehousing industry. However I do feel, that regardless of the warehouse space you have available, there undoubtedly will be a heavy burden placed upon the industry to take care of all of the demands that will be made.

During the last war the Department of Agriculture was one of the largest customers the warehousing industry had. This warehouseman-customer relationship was always conducted on a high plane, with a mutual understanding of each other's problems. We had many serious problems then as we will have under this emergency. We found that you had a personal interest in the problems of your customer. You cooperated with us in every possible way. This same spirit of cooperation has continued through today. We can accomplish much more when we have mutual interests and understanding.

I want to assure you that the Department of Agriculture, as one of your big customers, is highly interested in the development of your industry.

We are familiar with many of the problems that will cause you considerable concern during the next few years. If we can be of any assistance to you in overcoming these problems we want to do so.

We are all working for the survival of the freedom-loving people of the world and each has his own part to fill.

Food and Fiber Reserves Vital to Defense

Accumulation of needed food and fiber reserves is a vital part of our defense program, and it is one in which the Department of Agriculture and the farmers cannot succeed without the full partnership of the warehousing industry. Your industry is thoroughly trained for the job that lies ahead. This Nation is fortunate to have in private industry such a well organized group with progressive leaders, ready and willing to shoulder its responsibility in this time of emergency. We in the Department of Agriculture can vouch for your ability to do your part well. During World War II, just a few years ago, we called on you to do some unusual tasks. All phases of your industry responded willingly, for which the Nation was grateful.

The Refrigeration Research Foundation Annual Meeting, February 2, 3, 4

THE annual meeting of The Refrigeration Research Foundation was held in Boston to review the work of the past year, counsel with its scientific advisers and plan future activity. The reports revealed many bright spots in the industry picture. Among these were the contributions being made to the war effort, the specific aids to industry operations, and the great interest of warehouse customers in the investigations being furthered.

The Scientific Advisory Council met on the first day to review current investigations and consider proposals for future work. This group of eminent scientists represents diversified knowledge in all phases of food procurement, processing and storage.

Membership Meeting

The meeting of the Foundation membership was held on February 3 with a number of the scientists in attendance. The visitors were welcomed to Boston by Dr. Samuel Prescott, Dean Emeritus of Science, Massachusetts Institute of Technology who is chairman of the board, T.R.R.F. He described continual progress in research at Massachusetts Institute of Technology which is being broadened by the establishment of a new food technology laboratory which will accelerate investigations in refrigerated foods. It will be a further aid to general progress because good research also shows how to put new knowledge to profitable use. Dr. Prescott also forecast a future of ever-increasing usefulness for the Refrigeration Research Foundation.

President Arthur Otis, in his discussion of the work of the past year, emphasized the debt the Foundation owes to Chairman Prescott whose unusual scientific knowledge and ability had been given so generously to the furtherance of its entire program. Mr. Otis spoke with satisfaction about the continually broadened financial support which the Foundation had received during the year. He recounted the numerous projects of great value to refrigerated warehouses and urged that everyone make greater use of the information given to them. Especially in these difficult times, he said it was fortunate that the Foundation continues to be ready to serve as a scientific department and research division of each member organization.

TRRF Officers for 1951

Chairman of the Board—Dr. Samuel C. Prescott, Boston, Mass.

President—Herbert Farnsworth, Boston, Mass.

Vice-president — William Sizer, Chicago, Ill.

Treasurer — E. G. Erickson, Chicago, Ill.

Secretary—H. C. Diehl, Colorado Springs, Colo.

Executive Committee: The officers and: E. M. Dodds, Chicago, Ill.; G. F. Dodson, San Jose, Calif.; J. P. Johnson, Washington, D. C.; J. F. Meagher, Baltimore, Md.; R. C. Muckerman, St. Louis, Mo.; Arthur Otis, New York, N.Y.

Newly elected members of the Board of Governors: Fred Alford, Alford Refrigerated Warehouses, Dallas, Texas; G. F. Dodson, Security Warehouse & C. S. Co., San Jose, Calif.; E. M. Dodds, United States Cold Storage Corp., Chicago, Ill.; R. C. Muckerman, City Products Corp., St. Louis, Mo.; J. F. Meagher, Merchants Terminal Corp., Baltimore, Md.; Arthur Otis, Merchants Refrigerating Co., New York, N. Y.; Lowell Kern, Terminal Ice & C. S. Co., Portland, Ore.; Garth Shoemaker, Hygeia Refrigerating Co., Elmira, N. Y.

Treasurer William Sizer presented a complete report and analysis of the financial affairs of the Foundation which, he said, is on a substantial basis. Because of its demonstrated benefits, it is apparent that the organization is assured an excellent future. Present conditions provide a good opportunity to establish basic reserves because the tax situation is favorable to contributing organizations. He urged industry companies to make their contributions for three to five years in advance as originally contemplated when the Foundation was set up. This, he said, would give greater stability to the program that necessarily is long range.

Chairman Jerry Johnson presented recommendations of the nominating committee for new members on the board of governors. The recommendations were adopted unanimously and nominees were elected to office.

Report of Cold Storage Advisory Committee

A report on the activities of the Cold Storage Advisory Committee established under the Research & Marketing Act was presented by Paul Christensen. Five meetings have been held to suggest direction of investigations to preserve foods better by refrigeration. Industry interest has been shown by some 100 suggestions transmitted to the committee. The report of the meeting of February 1 was summarized by Mr. Christensen (printed in this issue). In commenting on the general trend of R.E.M.A. investigations, Mr. Christensen gave great credit to T.R.R.F. for establishing a broad base of knowledge in this field.

In the discussion of some of the details of the advisory committee activity, Director H. C. Diehl of the Foundation urged everyone to support continued availability of necessary packaging materials for foods that are cold stored. This he said is of direct interest to warehousemen because protective packaging is not decorative and the impression should not be allowed to persist that such packaging is decorative. Mr. Diehl described and commented upon steps which have been taken to alert and inform government control agencies and associated industries of these facts.

Values Received

The values received by the refrigerated warehousing industry from Research and Marketing Act investigations have been greatly enhanced by the large store of specific knowledge established by the Refrigeration Research Foundation. This fact was stated by Harlan Nissen, member of the Advisory Committee, who continued that government officials are greatly impressed by the foreward looking and progressive attitude of the industry demonstrated in the Foundation. This, he said, has promoted more extensive coverage and greater progress in the government-supported work.

Director's Report

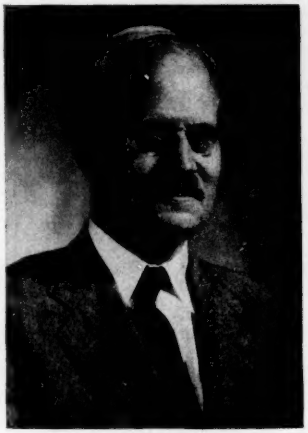
The informal report of Director H. C. Diehl, discussed some of the factors covered fully in the printed booklet which had been distributed. The underlying purpose of the Foundation, he said, is not primarily materialistic. It is a problem of the age that material advances have outstripped human applications. He emphasized that Foundation contributions are not charity or an expression of good will but really are an investment in the future of the industry which will permit it to serve the public better. Examples were cited of investigations which already have brought added business and revenue to refrigerated warehouses.

Foundation publications, Mr. Diehl pointed out, transmit information and data that can be directly applied by warehousemen and others who use their services. To facilitate operations, especially in the face of the present national emergency, the Foundation office has been moved and set up in Colorado Springs. Thus it is possible to keep closer contact with varied activities throughout the country.

Because of broadened experience through seven years' contributions to the Foundation, it now gives a greater return to the industry per dollar of investment. This, Mr. Diehl indicated, runs counter to the general rise in costs, but it is a fact that Foundation projects now yield more for the money spent on them. They are an important factor in the steps that have been taken to set up a low temperature laboratory in the Department of Agriculture, Western Regional Research Laboratory at Albany, Calif. The years of research and investment by the industry have built the basic structure from which cold storage projects under the Research and Marketing Act can advance much farther. In conclusion Mr. Diehl expressed appreciation to the eminent scientists, officers, and other collaborators and industry men whose cooperation have made these many beneficial results possible.

Work Under Research And Marketing Act

The work under the Research and Marketing Act was discussed by Dr. Barnard Joy, of that agency, Washington, D. C. He stated that the value of research is limited if its results are not carried over into benefits for the whole people and their economy. This is the fundamental objective of the work under the Research and Marketing Act which gave the Department of Agriculture two new opportunities to further such work. One was to arrange contracts for work by agencies outside the department; the other was to obtain the benefit of policy advisory committees set up on a formal basis. This aided in furthering the program. It also ties activities together to accelerate valuable contributions to the whole economy.



Dr. Samuel C. Prescott, Boston, Mass.
Chairman of the Board
Refrigeration Research Foundation

Money is not available, Dr. Joy continued, to carry out all suggestions received. It is true, however, that the research directly applicable to cold storage of foods has been multiplied four to five times in ratio to what was available previously. Facilities are being set up which will have great value over a long period of time. In this connection Dr. Joy described the equipment being installed by the Western Regional Research Laboratory for broadened work in the low temperature field. In conclusion he reviewed some of the particular projects now in progress.

As a member of the Scientific Advisory Council, Dr. Donald Tressler was in attendance. He is technical director of the Quartermaster Food & Container Institute, Chicago, and discussed some of the problems with which the Institute is now concerned. In order to provide better meals for armed forces men under certain adverse conditions, the Institute is working on frozen pre-cooked meals. Some of the factors in this work were analyzed and Dr. Tressler invited suggestions in this and other problems.

Joint Meeting TRRF and NARW

A joint meeting of the Foundation and the N.A.R.W. membership was held in the afternoon of February 4. Presiding was President J. L. Gagini of the latter organization who said that the meeting should stand as an additional tribute to the farseeing men of the industry who had established the Foundation. These men knew that continual advance in knowledge is a requirement to insure a good future for refrigerated warehouses. This, he said, had been demonstrated in the good relations and the cordial cooperation between all the association people and the Foundation.

President Arthur Otis of the Foundation, responded with a discussion of the inter-relationship of the two organizations. The association, he said, represents the sales and public relations division, while the Foundation is the research department as maintained by any good business. No one company, he pointed out, could afford to maintain a really effective research department so the Foundation carries this work on admirably for all companies in the industry. He thanked Mr. Gagini and presented a gavel to him as a momento of this appreciation.

Examples of the effective work of the Foundation were then given in specific reports by the men actually doing the research in several different fields.

Shrimp Investigation

The investigation to determine the cause and prevention of black spot on shrimp was described in a paper by E. A. Fieger, Department of Agricultural Chemistry, and Biochemistry, Louisiana State University, Baton Rouge, La. It proved to be a very interesting and valuable report. Some of the industry benefits are summarized elsewhere in this edition and the complete paper will be published in an early issue. In commenting on the results of the work which industry men characterize as very productive, Dr. Fieger mentioned the three years of intensive effort which have gone into the project. There were many discouragements and he expressed gratitude for the continuing support of the Foundation which aided in the successful results. Research, he pointed out, is basically theoretical, but it led, in this case, to quite practical applications.

Cold Storage of Citrus

Some aspects of the investigation on cold storage of citrus fruits were discussed by W. T. Pentzer, U. S. Bureau of Plant Industry, Soils and Agricultural Engineering, Washing-

ton, D. C. He explained the team work which has gone into this particular investigation. It has a great potential despite the fact that frozen juice concentrates have built up large volume lately. Fresh fruit, he said, is still very important and sells in large volume. The concentrate is going into the canned juice field, and Mr. Pentzer cited experience to show that processed forms of fruit have not eliminated the fresh market.

In a preliminary report on grapefruit storage, Mr. Pentzer indicated that most of the direct investigation was done last year because of recent unfavorable weather conditions which affected grapefruit. Because it belongs to the low-temperature sensitive group, three temperature levels were selected for the investigation: 31 F, 38 F, and 52 F. The 38 F level showed more pitting and low temperature injury, so it was ruled out, he said. Mold and decay were checked rather well at 31 F for a period from eight to twelve weeks, but deterioration at higher temperature during the seven day marketing period was a limiting factor. The Florida fruit showed too much decay when held at 52 F, but Texas fruit gives more promise at this level.

Work in Producing Area

The work in the producing area on citrus storage was recounted by Paul Harding, U. S. Bureau of Plant Industry, Soils and Agricultural Engineering, Orlando, Fla. He prefaced his discussion with statistics on citrus fruit consumption which considerably outstrips all other fruits. In Florida alone, 1950 production was 63 million boxes of oranges, and California added 42 million more. Half of the Florida oranges were processed and 21 million gallons of concentrate were produced but the fresh orange market remained at 30 million boxes. Production for the next few years, he said, is expected to reach 150 million boxes with much of it moving through storage.

Investigation of cold storage of oranges was carried on at temperatures of 30, 32 and 38 F. The two lower levels were found to be similar in their preservation of the fruit. At 32 F satisfactory results were obtained on holding periods of from eight to twelve weeks. Pitting and aging were not a factor. There was a slow reduction in sugar content, volume of juice, and content of vitamin C.

The investigation included use of box liners and cartons treated with diphenyl which proved to be an aid in reducing stem end decay. The work on treated cartons may prove quite fortunate during the emergency because boxes may become scarce. Dr. Harding reported that the tendency to decay in oranges from some groves was greater than from others. At the higher temperatures in the marketing period, after cold storage, the larger fruit showed somewhat more rapid decay than the smaller. The root stock on which the fruit is grown, Dr. Harding said, may have some bearing on the storage quality of the oranges.

That portion of the investigation carried on in the market centers was described by James Wiant, U. S. Bureau of Plant Industry, Soils and Agricultural Engineering, New York City. He indicated that the investigation was carried on in commercial scale. Carloads of oranges were stored in refrigerated warehouses at New York City and Providence, R. I. Previously complete data on these carloads had been assembled. Moreover the handling and sale of the fruit followed general industry practice in that it was owned by commercial dealers and they removed it from storage in accordance with their own ideas for the purpose of making a profit. The oranges, Dr. Wiant said, were stored for periods of from four to twelve weeks, with an average at about eight weeks. Commercial success was indicated by the sale of two carloads held for twelve weeks at an increase of $1.25 per box. Dr. Wiant emphasized that the fruit purchasers placed this higher value on the oranges which had been stored. He concluded with a summary of the continuing investigation on the storage of lemons. This fruit, he said, has customarily been stored for about

Assured Future for Refrigerated Warehouses

THE fruit enjoying the largest volume sale in the United States promises to become a regularly stored commodity in the near future. U. S. Department of Agriculture experts, Pentzer, Harding and Wiant reported to the TRRF meeting that commercial scale tests of fresh orange storage have produced good results as far as the fruit is concerned. It also paid a satisfactory return to the storers. Don't worry about the inroads of frozen orange concentrate on the fresh orange market, they say. It is mostly a problem of the canned juice people. Sale of fresh oranges is stable. This is a new field; orange storage will be all new business.

Candy and Ingredients

A lot of materials go into candy in addition to sugar. Peanuts, for instance, bulk very large and for the most part have not been cold stored. According to J. G. Woodroof, Georgia Agricultural Experiment Station, storage of peanuts in refrigerated space prevents insect infestation and rancidity, and maintains general quality of peanuts over a long period. The same benefits apply to roasted peanuts contained in candy.

The investigation by Dr. Woodroof on candy has shown that most candies can be cold stored for any desirable period. This research, aided by TRRF participation has evoked great interest among candy manufacturers, and those in the Boston area were represented at the meeting along with the National Confectioners Association. Candy and its ingredients have definitely been lined up as refrigerated warehouse commodities by these investigations.

New Markets for Shrimp

One of the most troublesome problems in the marketing of shrimp is the development of Black Spot on the tail and shell, and other surfaces of shrimp. In the third report to TRRF and industry members, the solution of this problem was announced by E. A. Fieger, Louisiana State University.

A seafood that has enjoyed great popularity all over the country, shrimp can be expected to gain in volume as a result of this and related investigations by Dr. Fieger under TRRF auspices. That will mean more business for the refrigerated warehouses and their good customers in the seafood industry.

These three examples of investigation made possible and guided by The Refrigeration Research foundation show how it is leading the way to new opportunities in the Refrigerated Warehouse business. All together, these activities do much to assure the future good volume of that business.

a three-month period in the production area. Lemon growers and retailers have shown keen interest in the investigation.

Selling Space

"Selling Space In or Out of Emergencies" was the title of a promotional address presented by Frank Kearney, vice president, J. Leo Cooke Warehouse Corp., Jersey City, New Jersey. Active space sale, he began, is the high road to profits, and every employee can aid in the sale of space. Yet some operators do not know how to practice the fundamentals of selling. They have neglected the human relation side both toward their employees and the public. This allows the public to gain faulty impressions of the industry. He pointed to the generally accepted idea that a warehouse is a dingy building which is mainly the scene of violent crimes in fiction, radio and television.

Better selling and advertising are needed, according to Mr. Kearney, and he suggested that warehouses tell the public how health and sanitation regulations are followed in their plants and how well goods are protected and maintained at full quality. In the period of war emergency ahead, he counselled everyone to take the best possible care of his customers. The seller's market which is coming is really a nuisance. It may turn many good customers away permanently. Warehouses can avoid this bad result but they must not be arbitrary or independent in their customer contacts. If present customers cannot be fully served or new ones cannot be accommodated, the exact reason should be explained to them and the consideration shown should be employed to establish friendliness and good will for the future.

Calls on Customers

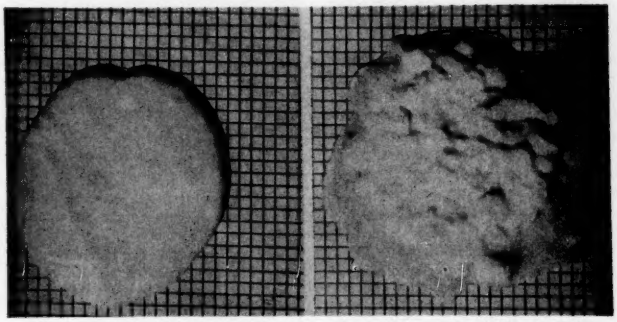
Throughout the emergency, there should be regular calls on the customer just as in ordinary times and the best sales promotion methods should be continued. Advertising and publicity remain vital factors and warehouse men should continue full participation in community affairs. At the same time, Mr. Kearney added, their warehouses should be maintained in the best condition possible. A warehouse, he said, is a guest house for merchandise. It accommodates the most famous names in the country which are the nationally advertised products. In conclusion he emphasized that the customer and his good will are the basis for all commercial success.

Research on Candy

The very significant information developed in the research on candy was briefly detailed by Dr. J. G. Woodroof, Georgia Agricultural Experiment Station. Eighteen diversified types of candy from all over the country have been studied and they give a good cross section of confectionery products. The volume of candy consumption is tremendous, Dr. Woodroof stated. It amounts to 900 million dollars per year of 17 lbs per capita.

There is great opportunity in the future for protection of candy by refrigerated storage, Dr. Woodroof said, because there is less consumption in warmer climates particularly, due to lower quality under higher temperature conditions. This opens a fine field for development to the refrigerated warehouse and Dr. Woodroof's reports showed that adequate methods of storage have been determined while the value of low temperature has been amply demonstrated. The paper, which included a valuable chart on optimum storage conditions, will be published in an early issue of ICE AND REFRIGERATION.

Control of Curdling in Pre-cooked Frozen Sauces



Frozen and thawed white sauces made with waxy rice flour (left) and wheat flour (right). Storage, five months at 0 F. Formula: skim milk 488 g.; flour 25-35 g.; and salt 3 g.

USE of flour made from waxy or glutinous rice, a type grown in a limited area of California, appears to be a practical way to solve the problem of curdling in white sauces and gravies used in chicken a la king and other pre-cooked frozen foods.

Experiments at the Western Regional Research Laboratory of the U. S. Department of Agriculture at Albany, California, over the past year have demonstrated that waxy rice flour, when substituted for other flours in frozen cooked sauces and gravies, yields products that do not require stirring or whipping when prepared for serving, even after freezing storage for many months. As a result the products when served retain whole pieces of chicken and other ingredients and the sauce retains its attractive white or creamy color.

These tests, conducted by Helen L. Hanson, Agnes Campbell, and Hans Lineweaver, have now been confirmed, so far as manufacturing phases are concerned, by a recent commercial trial. In the Laboratory tests some 60 starches, flours, and commercial stabilizers were used. Varying degrees of improvement in stability of the sauces were obtained, but waxy rice flour gave the most successful results. In flavor and appearance white sauce thickened with waxy rice flour and frozen, stored in the frozen state, and then reheated in a double boiler, is indistinguishable from freshly prepared white sauce.

Sauces thickened with wheat flour, however, show some separation of liquid and curdling immediately after freezing and this defect becomes worse with continued storage. Homogenization before freezing of the sauce has a slight stabilizing effect, but it is not sufficient to be of practical value. Mixing waxy rice flour (3 parts) with wheat flour (2 parts) has given a satisfactory sauce provided the sauce is homogenized.

Waxy rice is sometimes called "sweet rice" and is grown only in a limited area of California, near South Dos Palos. It is used chiefly in Oriental ceremonial foods and wafers that require a glutinous flour.

Refrigerated Warehousing Industry

NATIONAL ASSOCIATION of REFRIGERATED WAREHOUSES

Division of American Warehousemen's Association

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THIS MONTH IN BRIEF

The Cold Storage Advisory Committee, set up to assist in work being carried on under the Research and Marketing Act, held its fourth meeting recently to review the program under way and to make recommendations for future work. Chief attention was given to consideration of particular lines of work as being essential to mobilization, and to frozen food items that might prove useful to the military services.

The Eighth International Congress of Refrigeration to be held in London, England, August 29 to September 5, 1951 has announced its preliminary program. Four morning sessions will be held and papers on refrigerating subjects are now being solicited.

The monthly report on cold storage holdings as of January 31 shows a slight decrease over this time a year ago and the five-year average. However, occupancy is expected to continue its seasonal downward trend which started last November.

Cold Storage Advisory Committee Recommends Activity Under R & MA

IN connection with the work carried on under the Research and Marketing Act, the Cold Storage Advisory Committee was set up to consider work being carried on under the Act and offer suggestions on the course of future activity. The committee held its fourth meeting in Washington, D.C. on February 1.

In reviewing the program under way and in making recommendations for new work, the Committee gave prime consideration to whether particular lines of work are essential to mobilization. Special emphasis was given to probable needs of the military services and to problems of the civilian economy in light of shortages of manpower and materials and in case of disaster.

Review of Program Under Way

Work on the effects of temperature fluctuation of frozen foods should go forward as rapidly as possible to determine tolerances and maxima that can occur without injury to the product. Special emphasis should be given to frozen concentrated orange juice.

Other work under way that should be continued without diminution because of its special significance in relation to the emergency, and which should be completed more rapidly than originally planned, if that is possible, includes:

Development of frozen milk concentrate and its storage requirements that will permit satisfactory reconstitution. Develop storage requirements for frozen milk.

Educational work emphasizing the importance of production of clean eggs, because of deleterious effect of washing on maintenance quality in storage.

Effects of methods of processing and storage upon the quality of frozen poultry, particularly turkeys.

Improvements in shell treatment of eggs to improve quality maintenance in cold storage.

Improvement of methods for cold storage of citrus fruits.

Relation of method of cold storage of white potatoes to quality maintenance for various uses.

Cold storage requirements of precooked frozen foods.

Methods of atmospheric control, modification and purification in cold storage facilities.

More effective use of refrigeration to maintain the quality of farm products during transportation.

Educational programs with producers, consumers and "the trade" on preservation of food by refrigeration. Special emphasis should be given to release of results of research to the trade journals.

Collection and dissemination of market information on frozen foods and other products held in cold storage should be continued. However, as much reduction as possible should be made on number of item and frequency of reporting items included, retaining and including only those with specific value to a significant portion of the trade.

Recommendations for New Work

1—Development of additional frozen concentrates of fruit and vegetable juices and combination juices and the storage optimums, tolerances and maximums for frozen concentrates.

2—Development of additional dehydro-frozen foods and the storage optimums, tolerances and maximums for dehydro-frozen foods.

3—Effect of temperature and humidity fluctuations and development of maximums for products held in "cooler" storage.

4—Refrigeration requirements of frozen foods at various steps in distribution channel, such as loading to and from transit facilities, holding in wholesale houses and retail stores and development of methods to protect the quality of the product.

5—Survey of present and potential role of frozen food locker plants as sub-distributors of frozen foods.

6—Research on basic principles of thermodynamics and related fields such as heat transfer and the effect of ice formation on foods. A national low temperature laboratory staffed with able scientists should be established.

7—Investigation of the value of preservation of viability of seed by storage at temperatures at and below 32 F.

8—Relation of methods of curing and storage to the maintenance of quality of Bermuda type onions.

9—Development of improved and substitute materials for packaging and protective coating of commodities held in cold storage and locker plants.

10—Develop methods to prevent greening of white potatoes.

11—Research on cause and prevention of frost heaving in cold storage facilities.

12—Development of improved methods for freezing, refrigeration and storage of foods and for cooling and refrigeration of farm products on the farm.

13—Study of comparative costs and efficiency of freezing farm products in home freezers and in locker plants.

14—Educational work on use and limitations of home freezers for freezing foods.

15—Cooperate with other agencies studying effects of low temperature environment upon man, particularly the role of nutrition in development of resistance to cold.

16—Effect of air velocity and distribution in freezing upon quality of refrigerated commodities.

17—Effect of air velocity in storage upon quality of refrigerated commodities.

18—Distribution and movement of air in refrigerated warehouse rooms and its relation to engineering and operating problems.

19—Storage requirements of evaporated milk, particularly development of methods which will make turning of cases unnecessary.

20—Temperature and other conditions for the improved storage of floricultural products such as bulbs, corms, plants and tubers.

Other Recommendations

In view of increased need for economy in use of available funds, the committee and its members in reviewing research work done by the Department, State agencies and private organizations should be alert to possible duplication of effort and should promptly call such duplication to the attention of the Department.

The committee concurs in the following recommendation made by the Cotton Advisory Committee:

"That the possibility of securing additional flexibility in appropriations to take care of emergency research needs be explored and that the Committee ask for consideration of this problem at the next annual meeting of the Committee Chairmen and of the Agricultural Research Policy Committee. In this connection, the Committee stressed the fact that the time lag between budget preparation and the availability of funds appropriated for research, combined with the restrictions placed on the use of such funds, sometimes prevents or delays prosecution of urgently needed research because the necessity of such research is not known at the time the budget is prepared."

The representatives of the cold storage industry on the committee are: Paul B. Christensen, chairman; H. C. Diehl, vice chairman; Vallee O. Appel; A. R. Current, Arnold T. Hampson, Walter F. Henningsen, James C. Irwin, C. A. Martin, Harlan J. Nissen, S. C. Rogers, Horace W. Wilson. Executive secretary of the committee is Barnard Joy of the Research and Marketing Act administration.

Studies Frozen Foods

The development of additional frozen concentrated juices and dehydro-frozen foods that might prove useful to the military services was the top recommendation of the Committee.

As emergency situations may at times prevent holding commodities under optimum storage conditions, high priority was given to studies of the effect of fluctuating temperatures upon frozen and refrigerated farm products. Savings of transportation facilities and manpower might be made through wider use of the 11,000 frozen food locker plants as subdistribution centers for frozen foods. The Committee recommended a survey to determine the feasibility of such use.

Because of its special significance as part of a national defense program, the Committee commended work already done and urged continuation of work on frozen milk concentrate, frozen poultry, precooked frozen foods, and on a number of other commodities.

Other specific recommendations submitted by the Committee are: (1) Establish a national low-temperature laboratory for doing research on the basic principles of thermodynamics and related fields such as heat transfer and the effects of ice formation on foods: (2) investigate the value of preserving viability of seed by storage at temperatures around and below 32 F.; (3) develop improved and substitute materials for packaging and coating of commodities to be held in cold storage; (4) develop improved methods for freezing, refrigeration, and storage of foods and for cooling and refrigeration of farm products on the farm; (5) cooperate with other agencies which are studying effects of low temperature environment upon man, particularly the role of nutrition.

The Committee spent January 31 at the Department's Agricultural Research Center at Beltsville, Md. They had the opportunity to observe the facilities used for cold storage research and to discuss the work being done with the scientists who are conducting the experiments. Work observed included that on beef, pork, lamb, poultry, eggs, frozen citrus concentrate, apples, peas, potatoes, tree nuts, and seeds.

Members of the Committee who attended the meeting were: Paul B. Christensen vice president of Merchants Refrigerating Co., New York City (Chairman); H. C. Diehl, director of the Refrigeration Research Foundation, Colorado Springs, Colo.; Vallee O. Appel, president of Fulton Market Cold Storage Co., Chicago; A. R. Current, The City Ice and Fuel Co., Chicago; Arnold T. Hampson, treasurer of the Merchants Cold Storage and Warehouse Co., Providence, R. I.; Walter F. Henningsen, Sr., president of the Northwestern Ice and Cold Storage Co., Portland, Ore.; James C. Irwin, vice president of the United States Cold Storage Co., Kansas City, Mo.; C. A. Martin, Sr., president of the Polar Cold Storage, Inc., Nashville, Tenn.; Harlan J. Nissen, Terminal Refrigerating Co., Los Angeles; and Horace W. Wilson, president of the Quaker City Cold Storage Co., Inc., Philadelphia.

Messrs. Christensen and Diehl were re-elected chairman and vice-chairman, respectively, of the Committee. Also attending were Albert K. Mitchell, Albert, New Mexico, representing the Agricultural Research Policy Committee and Barnard Joy of the Department's Agricultural Research Administration who is executive secretary of the Committee.

Eighth International Congress of Refrigeration Announces Preliminary Program

SUGGESTIONS for papers to be read at the Eighth International Congress of Refrigeration are now invited. The formal part of the Congress extends from August 29 to September 5 inclusive. The remaining days beyond that will be devoted to organized excursions to the more distant plants and laboratories for those who wish to take part. The Congress will be held at London, England.

Allowing for the opening and closing ceremonies, there will be a minimum of four morning sessions available for the reading and discussing of papers, as follows: Thursday, August 30; Friday, August 31; Monday, September 3 and Tuesday, September 4. Where absolutely necessary, however, additional sessions can be arranged on Saturday, September 1 or on one of the afternoons.

Subjects

The subjects to be dealt with in the seven Commissions are as follows:

1. Scientific problems of low temperature physics and thermodynamics.
2. Physical-technical problems of industrial refrigeration.
3. Application of refrigeration to perishable foods with regard to their physical, chemical and biological characteristics and to their temperature.
4. Refrigerating machinery and apparatus, operation and test methods.
5. Application of refrigeration to stores, ice factories and chemical industries.
6. Transport by water and by land.
7. Research, education, general economics statistics, legislation.

It will be remembered that the Carlsbad resolutions, confirmed at Louvain in 1949. state that 35 pages only in the proceedings are to be allocated to each Commission for the reports of papers. It may be possible to arrange for this figure to be exceeded somewhat, but it is considered that the absolute maximum number of pages for the proceedings should be 500. This number would have to cover the papers of the seven Commissions, plus the list of members, reports of opening and closing ceremonies, resolutions, etc.

Except in the case of authors invited to submit papers by the Congress Papers Committee or by the President of a Commission, suggestions for papers only should be made in the first instance, as it may be that owing to the limitations above, not all the Papers offered can be accepted. To insure consideration, suggestions must be made at the earliest possible moment either to the President of the appropriate Commission or to the Chairman of the Congress Papers Committee.

It is worth noting that this process of selection will insure that only really good papers will be presented to the Congress.

Papers

Where possible papers should not exceed 1200 words. Papers should be submitted in triplicate. A summary of about 150 words should be submitted with each paper. Both papers and summary should be submitted in one of the two official languages of the Congress, English or French.

To allow overall control of the total numbers of papers and to facilitate organization of the Congress, all papers should be sent to: The Secretary, The Institute of Refrigeration, Dalmeny House, Monument Street, London, E.C. 3.

The Secretary will send a copy of each paper to the president of the appropriate Commission. The chairman of the Papers Committee, Dr. Griffiths, O.B.E., D.Sc., F.R.S. will consult with the presidents as to the papers to be selected.

Papers should be sent in as early as possible in 1951, and to reach the Chairman of the Papers Committee by March 1, 1951. They should be accompanied by the summary.

The names of those taking part in the discussions will be published in the proceedings, but their remarks will be published only if these are submitted in writing to the chairman of the meeting, or to the secretary of the Congress. As laid down in the Carlsbad resolutions, the time for reading a paper should be kept to a minimum to allow as much time as possible for discussion. The paper therefore need not be presented in full but will be available in full beforehand for those who are going to take part in the discussions, and, also, of course, available in the printed proceedings of the Congress.

The International Congress of Refrigeration, founded in 1908 by special Convention Treaty between the Governments of the principal powers, is universally recognized as a movement established for the promotion of the methods, applications and materials of the refrigeration industry.

Study of questions relating to the techniques and all aspects of refrigeration is carried on by seven International Technical Committees, whose members are responsible for the papers read and discussed at the Quadrennial Congress.

The Congress is the world-focus of refrigeration supplying to those interested in all phases of this applied science up-to-date and authoritative information on the subject.

Meetings of the Congress will be held at Church House, Westminster and official receptions will be accorded to delegates in London and other parts of the country. The Institute of Refrigeration and the British Refrigeration Association will assist visitors and guests, as will numerous industrial concerns and shipping companies. Excursions to refrigeration installations in and around London are planned for the first week, and in the provinces for the second week. A special program of entertainment has been arranged for the ladies.

Scope of Congress

Under the organization of the International Institute of Refrigeration, study of the scientific, technical, engineering, and economic aspects of refrigeration is conducted by seven International Commissions, as follows:

Commission I. Scientific problems of low temperature physics and thermodynamics; industries of the very low temperature and of the rare gases.

Commission II. Physical-technical problems of industrial refrigeration.

Commission III. Application of refrigeration to perishable foods with regard to their physical, chemical and biological characteristics and to their temperature.

Commission IV. Refrigerating machinery and apparatus; refrigerating plants and their operation; test methods.

Commission V. Applications of refrigeration to entrepots for preserving perishable foods, ice factories and chemical industries.

Commission VI. A.—Transport by water B.—Transport by land.

Commission VII. Research, education, general economics, statistics, legislation, propaganda.

Fur Storage Men Claim Retailers "Chisel" on Insurance Rates

COMMERCIAL refrigerated warehousemen are objecting to practices by certain fur retailers who send only part of their fur garments to certified cold storage houses, but obtain lower insurance rates on the ground that all their garments are being stored in certified vaults. It is claimed such a retailer indicates that his garments will be stored in certified vaults, and then ships only a small part of his stock to the warehouse and holds the balance in his store on the pretense that they are being repaired or remodeled.

Operators of refrigerated fur storages discussed this at the annual membership meeting of the Certified Cold Storage Association, consisting of some 221 members, both wholesalers and retailers. The point was made that they are losing a good share of their fur storage business to these "chiseling" retailers.

Insurance Rates

Insurance rates for furs stored in vaults of the type certified by the association average about 2½ to 3 cents per $100 of evaluation. The rates to an average retailer are probably 15 to 16 cents per $100.

Members of the association said that insurance companies have refused to consider wholesalers' complaints in the past. Some members suggested that the association point out to insurance companies that they are losing revenue by not charging a higher rate for garments not kept in storage in certified vaults. In line with this suggestion C. J. Hamilton, president of the Certified Cold Storage Association, advised members to furnish the association with details of such practices by retailers, this data to be presented to the insurance companies.

During the meeting a cost analysis procedure was discussed which would inform a cold storage firm what the costs, including hidden costs, was before the fiscal year's figures are tabulated. According to Jack Gregory of the United States Cold storage Co., Kansas City, Mo., secretary-treasurer of the association, the use of such cost analysis procedure on a supposedly successful operation disclosed that the firm lost money on storage but made up the loss on repairing and cleaning business. This, he said, is the general state of affairs nationally at the present time.

The membership voted to continue its program of consumer and trade paper advertising, playing up the benefits of storing fur garments in certified cold fur storage vaults. In addition, it was reported, the association will distribute promotion material to its members. The material will include point of purchase posters, circulars, direct mail, mat service, car cards, copy for telephone solicitation and radio scripts.

Concern with skyrocketing costs was expressed by Mr. Hamilton during the morning session. He said the cold storage industry was being squeezed at both ends—by the inflationary increase in operating costs, including labor; and by the unwarranted practice of competitors slashing storage rates. Careful control of operating and overhead expenses, it was hoped, might put the industry on a more solid footing.

In the election of officers, Mr. Hamilton was reelected president; Jack A. Gregory of U. S. Cold Storage Co., Kansas City, Mo., secretary-treasurer; Wallace Fager of Miller-North Broad Storage Co., Philadelphia, and Garth A. Shoemaker of Hygeia Refrigerating Co., Elmira, N. Y., both vice-presidents.

Directors were elected as follows: J. A. Cavanaugh, Interborough Storage Co., New York; W. J. Donnelly, Long Island Storage Co., Brooklyn, N. Y.; Hal Fates, Manhattan Storage Co., New York; D. G. Ellsworth, Citizens Fur Service, Buffalo; Edward J. Lesnewski, Revillon Freres, New York; and C. A. Aspinwall, Security Storage Co., Washington, D. C.

Cold Storage Fur Rates Increased

FUR storage prices are being increased at wholesale and retail levels by the Fur Storage Division of United States Cold Storage Co., Kansas City, Mo., according to Jack A. Gregory, manager. Mr. Gregory said the price increase, the first in 16 years, was necessary because of the greatly increased cost of operation. The present prices were established in 1935.

Prices for retail fur storage will be $4.00 for the first $100 evaluation instead of the former $3.00. The wholesale price range has been increased from $1.50 to $2.00 per garment as compared with $1.25 to $1.75.

Frozen Fruits and Vegetables in Storage

SEVENTY-SEVEN percent of the 144 million pounds of frozen peaches, raspberries and strawberries in storage December 31 were classified by warehousemen as to container size. Coverage of peach stocks decreased two points during December to 66 percent while classified stocks of raspberries and strawberries increased six and three points to 79 and 78 percent respectively.

COLD STORAGE STOCKS OF FROZEN FRUITS AND VEGETABLES IN PACKAGES OF ONE POUND OR LESS IN STORAGE NOV. 30 AND DEC. 31, 1950 (000 LBS.)

	December 31, 1950		November 30, 1950	
	Lbs.	Pct.	Lbs.	Pct.
Peaches	2,972	24	3,354	24
Raspberries	5,484	25	6,106	27
Strawberries	30,712	41	33,262	41
Asparagus	4,129	71	5,084	76
Beans, lima	26,238	64	25,121	59
Beans, snap	20,802	70	22,886	69
Corn, sweet	13,279	52	14,453	51
Peas, green	47,094	65	50,888	63
Spinach	9,290	77	11,011	85

This coverage was exceeded only once during the past year for each of the latter two items, when on March 31 eighty percent of the raspberries, and on August 31 80 percent of strawberry stocks were classified according to container size. The proportion of peaches and strawberries in retail containers, 24 and 41 percent respectively, remained unchanged from last month.

Total December 31 stocks of the selected frozen vegetables amounted to 292 million pounds. Sixty-four percent of this amount was reported by type of container, an increase of two percentage points over the November 30 coverage. The ratio of retail to institutional-sized packages showed a rise of two points in the over-all distribution; however there were some significant changes in individual items. Consumer packages of spinach and asparagus decreased eight and five percentage points, respectively, during December. Seventy-seven percent of classified spinach stocks and 71 percent of asparagus stocks were in the smaller-sized containers on December 31. Retail packages of snap beans, sweet corn and green peas increased slightly, percentagewise, to 70, 52, and 65 percent of their respective classified stocks. Stocks of lima beans in consumer packages rose to a new high with 64 percent of classified stocks reported to be in this size container, an increase of five points over November 30 stocks and two points above the previous high.

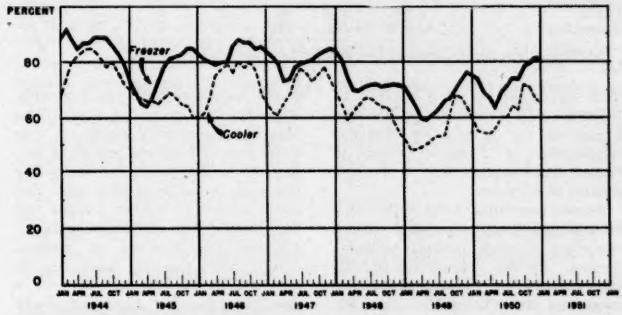
December 31 Cold Storage Holdings

PUBLIC cooler space on January 31 was 65 percent occupied, 6 points above occupancy of a year ago this time and 2 points above average. A decline of 2 points took place during January whereas the average January decrease in cooler space utilization is 3 points. Increases in cooler occupancy were reported in the East North Central, South Atlantic, West South Central, and Pacific regions, the largest gain being in the West South Central area where occupancy increased from 58 to 62 percent. The East South Central Region showed a decrease in space utilization of 13 points, followed by 9 and 7 point drops in the Mountain and Middle Atlantic States.

Freezer occupancy at 81 percent remained the same as last month. On January 31, 1950 freezers were 75 percent occupied and average occupancy is 79 percent. Decreased utilization of freezer space in the Middle Atlantic, South Atlantic, East South Central, and Pacific areas were offset by increases in other regions. Detroit and St. Louis were the only cities reporting an occupancy above 80 percent for both cooler and freezer space.

Cooler-held commodities amounted to 2.4 billion pounds and foodstuffs stored in freezer space totaled 2.1 billion pounds on January 31. This reflects a net withdrawal of approximately 400 million pounds of cooler items during January, while freezer commodities increased about 20 million pounds. A year ago this time there was a net withdrawal of some 350 million pounds of cooler commodities and a net increase of about 35 million pounds of freezer items. Net withdrawals of apples, pears, canned fruits and vegetables, cheese, and dried eggs resulted in the net decrease of cooler weight, while the into-storage movements of such freezer items as beef, pork, sausage, and edible offal was not quite enough to offset withdrawals of the remaining freezer commodities.

A net increase in storage stocks of dried and evaporated fruits, potatoes, onions, nutmeats, and tree nuts in which were about average. A 35 percent reduction in pear holdings left a little more than a million bushels in store at the end of last month.



Occupancy of public refrigerated warehouses, 1944-1950

Fresh apple stocks on January 31 were at an all-time high for this time of year. The 27 million bushels on hand compares with 20 million in store last year and average January 31 holdings of 17 million bushels. During January, net withdrawals from storage totaled 7 million bushels which was reported over holdings of a month earlier, whereas other fresh fruits, canned fruits and vegetables, and peanuts in shell were in lesser supply on January 31.

Frozen fruit holdings were reduced by 24 million pounds during January, leaving 426 million pounds on hand.

(Data for this report are collected from public, private, and semiprivate warehouses, apple houses, and meat-packing plants. Commodities in space owned or leased and operated by the armed services are not reported. All January 31 figures are preliminary.)

TABLE I—COLD STORAGE HOLDINGS IN PUBLIC, PRIVATE AND SEMI-PRIVATE WAREHOUSES, APPLE HOUSES AND MEAT PACKING PLANTS (000 LBS.)

	Jan. 31, 1951	Dec. 31, 1950	Jan. 31, 1950	Five-year Average
Meat and meat products, lbs.	957,456	769,708	849,825	830,812
Lard and rendered pork fat, lbs.	88,753	69,857	92,949	118,710
Frozen poultry, lbs.	281,878	281,972	295,736	283,707
Creamery butter, lbs.	73,686	105,192	103,657	37,230
American cheese, lbs.	155,453	187,157	159,906	113,421
Other cheese, lbs.	17,617	18,471	13,559	15,903
Shell eggs, cases	76	34	380	272
Frozen eggs, lbs.	32,088	47,310	55,052	88,308
Apples, bu.	26,501	33,621	19,573	17,245
Frozen fruits, lbs.	425,629	449,989	279,255	348,405
Frozen vegetables, lbs.	378,004	425,170	339,316	269,808
Frozen fish, lbs.	131,088	157,722	125,516	121,595

TABLE II—PERCENTAGE OF SPACE OCCUPIED BY PUBLIC COLD STORAGE WAREHOUSES (APPLE HOUSES EXCLUDED)

	Net Piling Space (000 cu. ft.)		Jan. 31, 1951 (%)		Dec. 31, 1950 (%)		Jan. 31, 1950 (%)		5-Year Average (%)	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	3,016	5,549	63	87	64	87	56	84	54	81
Middle Atlantic	34,741	30,720	64	83	71	85	56	71	60	79
East North Central	27,982	25,068	69	85	68	83	58	71	58	80
West North Central	9,127	14,355	74	88	74	85	73	83	66	84
South Atlantic	8,514	6,865	60	79	59	82	60	77	60	85
East South Central	2,812	3,181	68	80	81	83	69	82	69	81
West South Central	6,856	7,021	62	63	58	62	58	58	62	84
Mountain	1,574	2,291	50	71	59	70	51	80	59	83
Pacific	16,758	21,525	60	73	58	77	57	75	59	73
United States	111,380	116,575	65	81	67	81	59	75	63	79

TABLE III—PERCENTAGE OF SPACE OCCUPIED BY PRIVATE AND SEMI-PRIVATE REFRIGERATED WAREHOUSES AND MEAT PACKING PLANTS (APPLE HOUSES EXCLUDED)

	Private and Semi-Private Warehouses						Meat Packing Establishments					
	Net Piling Space (000 Cu. Ft.)		Space Occupied—Per Cent Jan. 31, 1951		Dec. 31, 1950		Net Piling Space (000 Cu. Ft.)		Space Occupied Jan. 31, 1951		Dec. 31, 1950	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	183	296	67	73	79	77						
Middle Atlantic	1,429	1,748	55	82	70	80	1,409	283	86	84	81	86
East North Central	6,485	5,375	64	68	84	61	3,861	1,153	90	87	92	87
West North Central	380	1,845	98	80	95	87	12,425	5,983	92	90	91	80
South Atlantic	508	2,764	79	67	91	70	955	228	86	100	83	100
East South Central							351	94	83	88	80	88
West South Central					58	100	2,525	500	100	100	100	100
Mountain					95	62	640	391	95	99	85	96
Pacific	3,631	3,272	46	66	45	70	2,835	621	97	96	97	96
United States	12,616	15,300	59	71	67	73	25,001	9,253	92	91	92	84

NOTE: Blank spaces indicate that insufficient returns were received.

This net reduction of 5 percent in holdings since December 31, 1950 was accounted for largely by seasonal withdrawals of 12 million pounds of frozen strawberries and 5 million pounds of cherries.

Frozen vegetable stocks withdrawn from storage last month were almost twice the average January seasonal decline. At the end of last month total stocks of frozen vegetables amounted to 378 million pounds which were 47 million pounds less than stocks on hand a month earlier. All frozen vegetable items reflected seasonal withdrawals, but the greatest was reported in the stocks of green peas, which declined 18 million pounds to 87 million pounds. Smaller reductions of 6 to 8 million pounds were indicated in the storage holdings of snap beans, lima beans, and sweet corn.

National holdings of creamery butter were down to 74 million pounds by January 31 as net withdrawals during the month totaled 32 million pounds. Withdrawals last month were three times the seasonal decline of last year and compare with the average January reduction of 13 million pounds.

Cheese in storage likewise showed greater than average withdrawals during January. The net reduction of 33 million pounds compares with 16 during the January 31 five year period ended 1950 and 12 million pounds last year. Stocks of American Cheddar at 155 million pounds and holdings of other varieties of 25 million pounds or a total of 180 million pounds in store on January 31 were only 3 million pounds above holdings last year.

Shell eggs moving into storage last month brought total stocks to 76 thousand cases as compared with 380 thousand this time last year. Frozen egg holdings of 32 million pounds were about one-third average January 31 stocks.

Poultry in storage showed no significant change as stocks at the end of last month of 282 million pounds were only 94 thousand pounds less than the December's stores. A seasonal gain of 7 million pounds in turkey stocks was countered by a like decrease in holdings of fowls. The latter totaled 68 million pounds and the former 117 million pounds by January 31. Holdings of broilers, fryers, and roasters were almost identical to the amounts on hand a month earlier, but stocks of ducks decreased some 2 million pounds during January. Increased poultry stocks were reported in the South Atlantic and Pacific Coast States.

The seasonal into-storage movement of 13 million pounds raised total beef on hand to almost 160 million pounds. Although these supplies were greater than last year's holdings they were nevertheless below the January 31 average holdings. Pork supplies were increased by 166 million pounds during January to total 666 million pounds by the end of the month. Of this total, frozen pork amounted to 426 million pounds, which was 136 million pounds greater than the January 31 average and compares with 331 million pounds in store last year.

National holdings for all types of pork exceeded the 5-year average supplies by 141 million pounds and were the greatest for any January 31 since 1941. Lard and rendered pork fat in refrigerated storages amounted to 89 million pounds as compared with 70 million pounds in store a month earlier.

Storage Outlook

Public cooler occupancy should continue on its downward cycle which began in November last year. During January cooler occupancy declined in accordance with the seasonal pattern but not as strongly as past records indicate. Since the peak of last year there has been a 7 point reduction whereas average performance during the last five years indicated a drop of 10 points could normally be expected. Fresh apples moving from store during February will keep cooler occupancy on the downward cycle but with the shell egg movement getting under way occupancy may not fall off as much as past records would indicate especially if the rate of movement out of storage for apples does not increase substantially.

Freezer occupancy leveled off during January which was also contrary to past performance. Normally a 2 point decline during January is reported but last month freezer occupancy remained at 81 percent. This could be accounted for by the significant increase in meat stocks and the contraseasonal movement of poultry during January. It is unlikely that freezer occupancy by the end of the month will be as high as 81 percent since there is only one instance on record of an increase during February and that occurred in 1944. It can be expected that occupancy will drop at least 2 points as frozen poultry, fruits, and vegetables move from storage.

Canadian Holdings of Fruits and Vegetables

THE Dominion Bureau of Statistics of Canada, Agricultural Branch, reports the following commodities held in cold storage on January 1, 1951.

Apples in cold storage on January 1, 1951 amounted to 6,101,000 bushels compared with 8,101,000 bushels December 1, 1950 and 6,826,000 bushels January 1, 1950.

Frozen fruit holdings in storages and factories January 1, 1951 amounted to 16,742,000 pounds as compared with 17,603,000 pounds December 1, 1950 and 14,044,000 pounds January 1, 1950.

Stocks of frozen vegetables in storages and factories on January 1, 1951 amounted to 11,477,000 pounds as compared with 12,525,000 pounds December 1, 1950 and 6,991,000 pounds January 1, 1950.

THE ICE INDUSTRY

NATIONAL ASSOCIATION OF ICE INDUSTRIES

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1706 L St. N. W., Washington 6, D. C.

Executive Secretary
Guy W. Jacobs, Washington, D. C.

President
H. O. McLain, Chicago, Ill.

First Vice-president
E. F. Condon, Los Angeles, Calif.

Second Vice-president
Wm. J. Ayers, Memphis, Tenn.

Treasurer
Geo. Steers, Jr., Kalamazoo, Mich.

THIS MONTH IN BRIEF

New and increasing regulatory measures are being adopted as the nation's preparedness program gets under way. Many of these are of direct significance to the ice industry. They are summarized and discussed in a recent bulletin issued by the National Association of Ice Industries.

An ice company operating in San Jose, Calif. markets its entire output through ten vending machines, located in and about San Jose. This method of selling ice has many advantages, as told by the manager of the company at the recent annual convention of the California Association of Ice Industries.

A panel discussion at the National Ice Convention covered new uses for ice and opening up new markets. Talks by six ice producers are summarized, with the thought that many of these experiences may be utilized or adapted by other ice companies.

The trend toward the use of ice in other than block form offers an opportunity to the ice industry to expand its market. This opportunity is not only in the commercial but also in the domestic field. There are many homes, with mechanical refrigerators, where sized and cubed ice would be used more extensively if it were made more readily available.

Guy Jacobs Executive Secretary National Association of Ice Industries

AT A MEETING of the Association's executive committee in Chicago Guy W. Jacobs was appointed new executive secretary of the National Association of Ice Industries, Washington, D. C. Mr. Jacobs has served as public relations director of the Association since 1935, and as acting executive secretary since last November. In addition, he was NAII president for the years of 1938 and 1939. He succeeds Mount Taylor, who will retire after 15 years' tenure of the secretarial position.

Guy W. Jacobs
Executive Secretary, NAII

In 1942 Mr. Jacobs joined the U. S. Office of Price Administration as adviser on ice industry price rulings. Though returning to private industry the same year, he continued this work for OPA on a consultant basis throughout the remainder of the war.

The National Association of Ice Industries was organized in 1917 with headquarters in Chicago. Its offices were moved to Washington shortly after the start of World War II. Mr. Jacobs will be only the third executive secretary to serve the Association in its 33-year history.

"NAII rendered the most valuable service of its career to member ice companies during the past national emergency," declared Mr. Jacobs upon accepting the appointment, "and our staff is thoroughly prepared to cope with whatever problems this new emergency will present for the industry. I know that the ice industry, in turn, stands ready to fulfill again its vital role in the preparedness effort."

Price and Wage Controls Affect the Ice Industry

THE nation's preparedness program is getting under way with new and increasing regulatory measures. Some of these, of direct interest to the ice industry, are summarized in a recent bulletin issued by the National Association of Ice Industries.

Under the general price ceiling regulation, the price of ice shall not exceed the highest price established during December 19, 1950 to January 25, 1951 inclusive. The regulation provides that anyone engaged in the selling of commodities or services covered by the regulation must prepare and keep available for examination by the Director of Price Stabilization for a period of two years records showing the prices charged for the commodities or services.

Seasonal Price Schedules

Some ice companies have different price schedules applicable during the winter months than those prevailing during the summer months; particularly with respect to dealers. It is apparent, therefore, that certain relief from the current price "freeze" will be necessary to permit these companies to maintain their relative profit positions. Aware of this problem, the National Association is moving ahead with the preparation of a petition to the Office of Price Stabilization for an amendment whereby this equitable relief can be authorized. This effort is to be in the nature of "class" petition designed to cover all ice companies similarly affected by the current "freeze."

If this is successful, the necessity

for individual ice companies to file separate applications for adjustments in their price schedules, due to seasonal factors, perhaps, will be avoided. To do an effective job, the Association needs all the facts relative to particular price situations. This information will be treated in a proper manner, without disclosing its origin, merging it into an industry approach to this important matter. If efforts to obtain this amendment fail, members of the industry will be advised as to the correct procedure to follow in seeking individual price relief.

The Defense Production Act of 1950, provides for the fixing or "freezing" of wages, salaries, etc. within an industry, simultaneous with price control. Pursuant to this authority, the Wage Stabilization Board issued its general wage freeze order, Wage Stabilization Regulation No. 1, effective January 25, 1951. Since that date, however, the policies to be followed by the Board have encountered tremendous pressures, of one kind, or another, due principally to the continuous increases in the cost of living. As a result, during the first two weeks of February the Board has released a number of additional regulations; Number 5, for example, authorizing increases for merit, length of service, promotion and certain other reasons, without Board approval. Thus, the wage control picture is still very much up in the air, mostly up.

Memorial Building Includes Modern Skating Rink

CITIZENS of Cambria County, Pennsylvania, honored their war dead recently with the completion of a $1,550,000 memorial building at Johnstown, prime feature of which is its indoor hockey and skating rink. Almost ten miles of wrought iron pipe were used in the refrigeration system.

Indoor skating rink new memorial building, Johnstown, Pa.

The unique "living memorial," which has 4,000 permanent seats, is shown here just before it was formally opened with an Ice Capades performance. This main wing measures 273 by 187 feet and is convertible for basketball, tennis, boxing and other sports and recreational events, including public dances. Temporary seats swell the convention capacity to 7,000.

Sales of Ice Dealers Shown in Census

SALES of ice, fuel, and fuel oil dealers in the United States amounted to $2,424 million in 1948, according to final Census of Business figures released by the Bureau of the Census, U. S. Department of Commerce. This represented an increase of 139 percent over the $1,014 million figure for 1939, the year of the next most recent Census of Business.

Despite this growth in sales volume there was a marked decrease in the number of establishments for these kinds of business as a group between the two latest Census of Business. In 1948 there were 22,670 fuel, fuel oil, and ice dealers in the United States compared with 41,172 in 1939.

Establishments classed as fuel, fuel oil, and ice dealers include three specialized kinds of business: fuel dealers (except fuel oil), fuel oil dealers, and ice dealers. Fuel dealers (except fuel oil) are those primarily engaged in selling coal and wood, or a combination of coal, wood, bottled gas, fuel oil, and ice. Fuel oil dealers specialize in selling fuel oil. Ice dealers are primarily engaged in selling ice.

For the workweek ended nearest November 15, 1948, there were 107,850 paid employees in fuel, fuel oil, and ice dealer establishments, of which 94,921 were paid for the full workweek. Total pay roll for 1948 in these stores amounted to $264 million.

The following table shows detailed statistics for ice dealers for 1948, including number of establishments, annual sales, payroll, proprietors, and workers.

SALES BY FUEL AND ICE DEALERS IN 1948 BY GEOGRAPHIC DIVISIONS

Geographic Divisions	Establishments (Number)	Sales, Entire Year (Thousand dollars)	Payroll, Entire Year (Thousand dollars)	Unincorporated businesses: Active proprietors (Number)	Unincorporated businesses: Unpaid family workers (Number)	Paid Employees: Total (Number)	Paid Employees: Full Workweek (Number)
	1948	1948	1948	1948	1948	1948	1948
New England	322	5,834	1,339	303	102	775	532
Middle Atlantic	808	12,582	2,946	777	197	1,241	1,083
East North Central	581	16,102	3,864	505	225	1,570	1,315
West North Central	335	6,114	1,675	306	143	868	623
South Atlantic	342	22,684	4,452	226	85	2,389	2,051
East South Central	206	6,494	1,490	138	46	797	692
West South Central	392	6,735	1,100	349	188	727	606
Mountain	41	1,762	419	38	27	149	135
Pacific	165	6,313	1,918	156	52	612	532
United States, total	3,192	84,620	19,203	2,798	1,065	9,128	7,569

Front and side view of 25-ton ice plant of Purity Ice Company at San Jose, Calif. The entire output of this plant is sold through vending stations

Ice Company Sells Only From Vendors

A good example of merchandising ice from vendors is provided by the Purity Ice Company, San Jose, Calif. which has ten vendors as its sole sales outlet

G. W. SCOTT
Purity Ice Co.,
San Jose, Calif.

THE Purity Ice Company, San Jose, Calif., manufactures and sells ice without benefit of delivery trucks, salesmen, collectors, or a large office force. It is all done through vending machines—ten of them. Ice is supplied by a 25-ton ice plant. Last year more than 2,000 tons of block ice and somewhat more than 30 tons of ice cubes were sold through these ten stations.

San Jose is a city of about 80,000 people, with four ice manufacturing plants, two of which operate a fleet of delivery trucks and 12 vendors, and the Purity Ice Company which operates an exclusive vendor business with 10 vendors.

Ten Vending Machines

These 10 vending machines, we have found during six years of operation, provide a complete answer to our selling needs. They do everything we ask them to do. They are neat and clean. If the customer wants extra service or unusual quantities or types of ice he knows where to get it. But best of all they sell ice and that's our business and our livelihood.

During 1950 each of these ten mechanical salesmen sold more than 200 tons of block ice, plus a combined sale of over 12,000 5 lb bags of crystal clear, handy to use ice cubes. This volume of 200 tons per unit is a figure we feel must be reached to give a fair return. Those which fall below this volume of business should be moved to a better location.

ICE AND REFRIGERATION has had some very valuable articles on location of vending machines and we have profited from this information. I believe they are equally beneficial to other vending machine operators, wherever they may be. Main arteries are of great importance, but the customer must be able to get into and out of the station with ease, and from the operator's standpoint the space rent must be nominal. These two requirements may be extremely difficult to find on a heavily traveled highway or street, but they are very important.

Our best vendor sells more than 450 tons annually. That's a good salesman, and much to our surprise when packaged cubes were installed in this unit, although strictly in an industrial area and no homes to speak of within a two mile area, cube sales were exceedingly high. Why? Travelers with small picnic chests, bars and taverns who run short of cubes in off hours, testing laboratories in nearby industrial plants who don't want bulky, dripping block ice are all good cube customers. Everyone, sometime needs that little extra supply of ice that the vendor offers 24 hours every day.

We are Sorry - Our Machine Failed
But
We are Happy - To Refund your Money
Thanks Again for Calling

Purity Ice Co.
PLANT and OFFICE
299 South 24th Street San Jose, California CYpress 5-0790

This refund card is used to return money to customers who report vendor failure. Slits in the card hold nickels, dimes and quarters and on the back are selling suggestions on picnic chests, party ice and other uses for ice.

From an address at the California Ice Convention.

Yes, I said to provide this kind of service means a high standard of servicing the vendor; not just opening the door of the machine and saying, "I think she'll get by 'til morning" and pulling away. It means that the machine must be checked fully, for ice chips that might catch, for slipping belts, for bent coin chutes, limit levers, anything that might cause a delivery failure. Remember if the ice doesn't come out, the money won't keep going in and the sales of ice will drop.

Keeping a Disgruntled Customer Happy

Don't be afraid to make a few refunds. It's cheap advertising. People will talk and you can hope it's for you and not against you. We have had refund cards made that hold nickels, dimes, and quarters that we mail to persons who have called in and told us of some vendor failure. This gives us an opportunity for product advertising and locations, plus a permanent record of customers for future business. On this card, we may suggest a picnic chest full of cubes for a party, or a package of salt for an ice cream freezer, dozens of follow up ideas can be incorporated.

For example, when we receive a 'phone call from, say Mr. Jones, our file is opened to the right page while he is giving us his name and address. Of course he is quite put out over the machine failure and usually starts out something like this, "Your blank blank vendor number so and so has gypped me every other time I put money in." We try to ask politely, "Did you call the office last time?" "Sure, about a month ago." Our file shows it may have been ten months ago, but of course we never question the customer's request for a refund and quite often get around his anger by saying,

"Well, Mr. Jones, our records show we made a refund on April 10, 1950 of 35 cents to you. Have you had trouble since then that you failed to call to our attention?" "No, I guess time slips by faster than I figure." By this time he is relaxed and if we feel he is in a joking mood we might add, "Well, I bet your wife has failed to get your breakfast more often than our vendor has failed to give you ice." The conversation usually closes with a friendly "thanks a lot" from the customer and a good word for the company.

Servicing the Vendors

Customer service is one phase, owners' service is something else. Anything mechanical requires attention and believe me, vendors are no exception. Many operators lose or waste many dollars that could be in their pockets by not defrosting often enough. Your power bills tell many stories if you will study and compare them. Wasted trips with trucks that could be eliminated, labor-saving devices such as a permanently placed ice slide for the truck, pallets and a light hand truck for packaged products, proper instruction for chopping the 300 lb blocks into correct sizes without picking up and laying down the ice pick several times, all are time savers and worth consideration.

Five minutes per block is sufficient for any vendor service man. This includes the time the box is entered until the last chip is cleaned from the floor. This requires good tieing tables and tools, but they will pay dividends. Arrange your truck schedules so there is no lost mileage in empty trucks. By this I mean start with a full truck and head for the empty vendor first and work back or around so the next stop will eliminate any long cross-town hauls the same day. Vendors usually have plenty of storage space to utilize this type of program. Try to remember that if you don't have to take a dollar out of your pocket for some unnecessary expense, it means you have another dollar.

Quality a Must

Service, we know, is very essential but quality is a must. A few days ago I was talking to a service station operator. Business conditions were the subject of conversation. He was crying about all the competition he had, possibly eight stations in the next five miles. "You ice men don't have stuff like that to buck against." "No," I fully agreed, "I wish we ice men were that fortunate." His eyes looked puzzled. "What do you mean?" I tried to explain that nearly every house on the street was an ice-making establishment making ice on a small scale and of a very poor quality.

This, fellow ice man, is where I think many manufacturers are making a sad mistake. We all condemn the mechanical home frozen cubes that the average housewife produces, but I've seen many ice company cubes that were a poor improvement. If you are going to sell cubes or "specialty" ice, be sure you, as ice men, can present a product that is so superior to anything that can be produced by a home-making mechanical gadget that it won't have a chance of competing. Price per package seems to have little bearing on a good product, especially "party" ice.

Package Cube Sales Double Each Year

Our packaged cube sales through vendors, doubled the first year doubled the second year, and we feel sure will more than double next year. To produce such a high quality product we try never to use the top 50's in making cubes. This gives us nearly perfect blocks for cutting into cubes and eliminates any hand picking before they are conveyed to the packaging machine. What do we do with the tops?

Late this last summer we installed our first crushed ice vending machine for dispensing 25 lb bags. We believe we can balance our sales of crushed ice with the cube cutting scraps and broken pieces or undersized chunks with broken corners, etc., which we do not allow to be placed on our vendor belts. In other words, we have no waste; this amounts to double profit because instead of a loss it can be sold at a premium price as "specialty" ice.

At this time we have no accurate figures on the crushed ice sales in paper bags, due to the short time the machine has been in operation, but we hope we can present our findings on this later. Our experience has convinced us that specialty ice and vending machines are the two most important ideas in the ice business.

Tea Council Pushes Iced Tea

MORE than $550,000 will be spent during the four months from May to August in an iced tea advertising and merchandising campaign, according to the Tea Council. Leading national magazines and thirty-three metropolitan newspapers will be used, along with specially designed and tested merchandising aids for the grocery and restaurant trade.

According to a recent survey conducted by a farm paper among its readers, 72 percent of the families; and in each 100 families, 229 persons drink iced tea.

Personal Mention

W. D. BEARD, owner of the Electric Ice Co., Ponca City, Okla., has been named chairman of the Ponca City Chamber of Commerce membership drive. The organization has been set up, he says, to contact every prospective member.

SELLING NEW USES FOR ICE

New uses for ice are being developed by ice companies with resulting increased revenues. How it is done is told here from a panel discussion at the National Ice Convention.

AT THE 1950 annual convention of the National Association of Ice Industries, a panel discussion was presented on increasing ice company revenues by introducing new uses for ice. As a practical demonstration of the possibilities, six representatives of ice companies told how they had originated and developed these new avenues for the sale of ice.

Preceding their presentation, R. W. Davis of San Francisco, moderator of the session, said ice companies generally are concerned with new ways of getting ice business. This requires constant changes, to meet competition and to meet public needs. This panel discussion, he said was designed to answer the question of how it can be done and the results obtained.

Paul Andres said:

This is a period of transition in the ice business and it is a very serious problem, particularly among the smaller plants that are not able to support a complete merchandising and selling organization. But whatever the problem, there is an answer.

Displaying Poultry on Ice

JACK WIGHTMAN
Serv-Ice Delivery Co., Akron, Ohio

LAST February we cooperated with Professor Stewart McKinnon of Akron University in making a poultry merchandising market survey. The work of conducting the survey was done by one of his students.

Our first step was to make a list of food stores. We assigned that to one of our route foremen with instructions that these stores had to meet the following requirements. First, they had to be equipped entirely with mechanically refrigerated equipment, and sell poultry one or two days a week, using no ice. Second, they could sell poultry one or two days per week and use ice for storage and/or displays. Third, those which sold fresh meats, but did not handle fresh poultry. From this we compiled a list of 14 stores.

We spent some time in framing a survey questionnaire and finally reduced it to fourteen questions. These questions, with the results of the survey are shown below.

This survey took some five or six weeks and during that time we conducted tests on a five-foot case which we installed in one of the markets.

The owner of this market had been selling from three to six chickens, only on Saturdays. His method was to dispatch his father in the family automobile to a nearby poultry store, procure the chicken and send it from there to the customer. We moved the case in and displayed 14 chickens on a Friday afternoon in a bed of crushed ice. All 14 of these chickens were sold by the following Tuesday morning. Results of this test are shown in the table on the next page.

The mechanically refrigerated chicken became almost unsalable at the end of the first 24 hour period, because of excessive discoloration. But to complete the record on weight variances during the test period, this chicken was held for five days. During this five day period the fryer, weighing 3 lbs. and 1 oz. when it was first purchased, shrunk to a weight of 2 lbs. 11½ ounces.

Questionnaire Used for Poultry Market Survey Among Food Stores of Akron, Ohio

	% Yes	% No	No Opinion
(1) Are you interested in any plan that will sell more poultry and increase your poultry profits?	86	8	6
(2) Do you know that large poultry producers are raising poultry for eating purposes only, to assure young, fresh, and flavorous chickens all the year 'round?	84	16	
(3) Have you heard about Swift & Company's national advertising campaign to promote the selling of poultry every day of the week and every week of the year?	49	50	1
(4) Do you agree that the public's buying habits can be changed so that fresh poultry may be sold every day in the week instead of just one or two days?	68	24	8
(5) What brand of poultry do you sell?			
(6) Does your poultry supplier provide you with sales aids such as advertising banners, pennants, streamers, etc?	17	83	
(7) Is your poultry packed in ice when you receive it?	51	49	
(8) Do you use any ice in storing poultry?	31	69	
(9) Do you use any ice in your poultry displays?	16	83	1
(10) Do you know that poultry stored in ice, and displayed on ice shrinks less, and retains its fresh flavor and its natural "bloom" (appearance) over a longer period of time?	87	10	3
(11) Do you agree with other Akron food merchants that poultry displayed on ice sells better?	71	9	20
(12) Would you be interested in selling "cut up" poultry to increase the volume of your poultry sales?	62	26	12
(13) How many pounds of poultry did you sell last week?			
(14) Did you suffer any loss because of weight shrinkage, or spoilage?			

FRESH POULTRY ICING TEST WEIGHT VARIANCE RECORD, GARFIELD SUPER MARKET, AKRON, OHIO, MARCH 10 THROUGH MARCH 17

Poultry	Weight Friday	Weight Saturday 24 hours	Weight Sunday 48 hours	Weight Monday 72 hours	Weight Tuesday 96 hours	Weight Wednesday 120 hours	Weight Thursday 144 hours	Weight Friday 168 hours
Rooster	4# 0 oz.	4# 1 oz.	4# 2 oz.	4# 3 oz.	4# 3 oz.	4# 3 oz.	4# 2 oz.	4# 1½ oz.
Hen	3#14 oz.	3#14½ oz.	3#14½ oz.	3#15 oz.	3#15 oz.	3#15 oz.	3#15 oz.	3#14½ oz.
Fryer	3# 0 oz.	3# 0 oz.	3# 1 oz.	3# 2 oz.	3# 2 oz.	3# 2 oz.	3# 1½ oz.	3# 1½ oz.
*Fryer	3# 1 oz.	2#15 oz.	2#13 oz.	2#12 oz.	2#11½ oz.	2#11½ oz.		

* The fryer protected by mechanical refrigeration became unsalable within the first 24 hour period because of discoloration.

In contrast, of course, the three chickens displayed and kept on ice were in perfect condition, suffering no weight shrinkage at the end of the 168 hour test period. One of these chickens was given to Mr. Porter who took it home for his Sunday dinner. In his letter of endorsement, Mr. Porter said, "My wife and I ate this chicken 9 days after it had been killed. We could detect nothing in the taste, or flavor, that would indicate it was anything but a freshly killed chicken."

Sales Campaign

In the ensuing sales campaign we used the figures from this test, reprints of a magazine article on poultry icing, and a letter by the merchant in whose store we had conducted the test. The immediate result was the sale of five 5-foot cases and two 3-foot cases. In addition, of the 100 stores contacted in the survey, about 20 are using ice in their mechanical cases on week ends for display and preservation of dressed poultry. And, we have only scratched the surface. Most of the 100 stores are still to be followed up.

This Testimonial Tells The Story

GARFIELD MARKET
1305 Brown Street
Akron, Ohio

The ServICE Delivery Co.,
551 South High Street,
Akron, Ohio

Gentlemen:

We were agreeably surprised with the results of the fresh poultry icing test which you conducted here.

Throughout this 7 day experiment, the chickens were displayed upon a bed of crushed ice during the day, and then covered with crushed ice for overnight storage. The chickens remained in the five foot Ice Display Case each night.

When the test was concluded, the chickens still had their natural "bloom", or color, and looked just as fresh as they were when placed in the display case 7 days before.

For your information, the chicken you gave to me was taken home and cooked some 48 hours after the test. In other words, my wife and I ate this chicken 9 days after it had been killed. We could detect nothing in the taste, or flavor that would indicate it was anything but a freshly killed chicken.

This test convinces us that Ice is best not only for keeping fresh chickens in a salable condition for a longer period of time, but it also adds colorful "eye appeal" to effective poultry displays.

We are pleased to certify the recorded figures on weight variance. The chickens were weighed every 24 hours during the 7 day test.

Yours very truly,
THE GARFIELD
SUPER MARKET
1305 Brown Street
By EDWIN J. PORTER

This 5 ft. Bohn ice display case was used to conduct tests on dressed poultry in Garfield Supermarket, Akron, Ohio. Fourteen chickens were sold within four days. Edwin J. Porter, owner of the store stands at the left.

Displaying Meat on Ice

R. W. DAVIS
Union Ice Co.
San Francisco, Calif.

DURING the past ten months we have been using crushed ice for displaying fresh meat. These tests are being made in a mechanical meat case and a combination ice-mechanical meat case. The results are very favorable to ice.

You go home and pick out some good, modern, mechanical meat case that has a space probably below the shelving where you can put some crushed ice, and with a drain connection. You tell them you will furnish some ice for two weeks, and let them play with it, and I think you will find a very much surprised and happy meat man. He will find that he will do entirely away with his trimming, he will eliminate practically all of his shrinkage losses, and when he reflects that he is paying about three cents an ounce for that meat he will see that savings in shrinkage will more than pay for the ice.

Glamour Ice Goes to Parties

MRS. HARRIET GRAY
Polar Ice & Fuel Co.
Indianapolis, Ind.

SEVERAL years ago at an Indianapolis home show we had a table showing the different sizes of ice with a punch bowl in the middle. One of our leading florists saw that table and said it was exactly what she had been waiting for all those years. Later she had us duplicate the punch bowl and other ice pieces and she used it, properly decorated, for a wedding reception.

Well, we didn't even know what she had done, but the next day we found out. We had a lot of telephone calls from people who had been at this wedding and they wanted a table decorated just like that one. As a result we built two such tables and they were in constant use until the war came along. Then we got so busy selling ice, and we changed our plant from a distilled water plant to the other type, and our engineer said we couldn't do it any more, it was no use trying, and anyway we were so busy we didn't need that kind of business and we didn't have any way of delivering it, and so we just dropped it.

But our customers didn't drop us, because they kept telephoning all during the war — couldn't we get them a punch bowl, and couldn't we sell them ice for their parties, and couldn't we suggest something they could use in this lovely clear ice, so they could make their parties a better event. We said no, we couldn't, because there was a war, and we couldn't sell ice because we couldn't get enough anyway for our other customers.

After the war, however, we began looking around for more business. I contacted my florist friend and she got busy, and immediately we started getting orders for just plain punch bowls, and every time one went out we said a little prayer and hoped it wouldn't leak.

We finally found a plastic insert to go inside the bowl, and we finally learned how to freeze flowers and different things into the punch bowls. We had a number of different types of tables built, round containers, square containers, a tray and a chrome plated tray about twenty-four inches in diameter. We have most anything that anyone could want to use to display ice.

We also contacted the local art school and found a young sculptress who wanted to earn money to put herself through school, and we offered to her the opportunity to come over and learn how to carve ice. She accepted, and every Saturday found her practicing on ice. Now she is an accomplished sculptress, and we advertise her as such.

We received another break last June when Elizabeth Taylor was married. One of our newspapers carried a front page story with the heading, "Miss Taylor Married Among Ice Doves and Churches of Ice." It went on to describe the doves that were carved out of ice, and the church with the flowers in the ice, and we couldn't have had a better advertisement for what we were trying to do. So we ran a part of that news story in our newspaper advertisement the next day with the heading, "Brides of Indianapolis can now have fascinating Ice Carvings," and we had to put three people on the telephone to answer the calls — could we carve

(Continued on page 44)

One of the ice decorated tables furnished for wedding receptions and other parties. This large round table is 46 inches in diameter. The top is insulated, and has a drain connection in the center. Within the base, is a ten gallon container to catch water from the melting ice. Three bags of nut sized ice are placed on the table top, and in the center, the ice punch bowl. A plastic liner is furnished with all punch bowl set ups.

Sunday Newspaper Features Indiana Ice Sculptress

THE interest value of ice sculpture and, in particular, of an attractive young ice sculptress was effectively exploited by the Polar Ice and Fuel Company of Indianapolis, Ind. The result was a three-column feature story with pictures in the Sunday magazine section of the Indianapolis Star.

Mrs. Harriet Gray, consumer service director at Polar Ice, reports that the company originally wrote to a local art school asking if any students there would like to practice ice-carving and eventually earn some pocket money from it. Two girls responded. One later dropped out, but the other took a liking to ice sculpture, stayed with it, and began to turn out salable pieces.

Mrs. Gray spoke of the girl to a representative of the Indianapolis Star, in which Polar Ice is an advertiser. The representative spoke in turn to the editor of the magazine section, who was immediately enthusiastic about the story. He sent out a reporter and photographer, at the same time requesting exclusive rights (other papers by now were after the story). The writeup headed "Icebox Studio," included pictures of the girl at work in the Polar Ice storage room and gave the company prominent mention. Ice sculpture itself was well promoted as a profitable pastime for young people.

Using chisels with deft fingers, Miss Janette Smith puts finishing touches on a polar bear carved from a block of ice. The Polar Ice & Fuel Company has popularized the use of these carved figures for dinner parties and receptions.

some doves like Miss Taylor had for her wedding? One lady even asked if we could carve tiny little doves for use in each glass of punch! She thought it might be an unusual idea. We thought so too, but at $12.50 a dove she became discouraged.

Now, our young lady can carve most anything. Last week we had a pink elephant requested for a cocktail party. They asked us if we could make that elephant look drunk!—and I ask you ladies and gentlemen, if you would know how to make an elephant look drunk? We studied this problem and finally came up with an answer. We made his legs cross in front, and his trunk heavy in front of him. He is now the talk of Indianapolis—the pink elephant that was drunk.

We were asked to furnish an unusual carving for a party observing the fiftieth anniversary of a woman's club, and we carved a bathing girl of fifty years ago with sailor collar and long stockings and high button shoes.

I think this market is ready and waiting in all small towns, in all big towns. We have shipped our ice punch bowls all over the state. I have had people come in from various small communities where there were ice plants, saying, 'Well, I can't get it from my ice company.' The business is there, ready to be developed. It requires only a small investment, and it is lots of fun.

Charges depend upon the service provided. Our lowest price on a plain bowl with a small container to catch the water and a little crushed ice under it is $6.50 and the price ranges from there up to $25 or $30 for a hand carved piece.

Storage of Vegetables at Point of Harvest

PAUL HOFF
Randon Ice & Coal
Milwaukee, Wis.

THERE are a number of vegetable canners around Milwaukee who rots and beets, about this time of year, which requires storage of the surplus. Most of this produce is stored for about three months, and some of the larger canners ordinarily store about 6,000 tons. Temperatures required are between 35 and 38 F and humidity requirements are not exacting.

When refrigerated warehouse space is short, these people find it difficult to procure adequate space and the result is that they are storing this produce in the field in what they term common storage, which is nothing more than a shed built in the field. One big canning concern at Hartford, Wis., has stored a surplus of beets and carrots in State Fair Park underneath the grandstand.

Now here's where the ice man comes in. In conversation with one of these big canners, I suggested that they blanket the vegetables with ice. Their immediate reaction was very favorable. They have stored practically all their beets. They will have to store about one thousand tons of carrots, which will take an area about two hundred by one hundred feet, ten feet high which, covered with a foot of crushed ice, would take a sizable amount of ice.

What we would like to do is to put about a foot of either block or crushed ice on the bottom, as a floor and then blanket the sides and top with crushed ice, using a blower.

Storage rental for the larger growers usually cost about $48,000 each year and, even at that figure, space might not be available. In addition the trucking expense of moving produce within an area of 30 to 80 miles from the field, amounts to a considerable figure.

We hope to show them that by substituting the ice method of storage they could dump their beets and carrots and other vegetable near the canning plant, with considerable savings in trucking and storage charges. They could buy a huge amount of ice and icing service and still save a lot of money.

Selling Ice For Fresh Produce

DICK FISCHER
Ice Delivery Inc., Fort Wayne, Ind.

IN 1945 we started promoting vegetable icing for produce in Akron, Ohio and up until May, 1950 we had well over 350 stores using ice for their produce. These stores used about 100 pounds of ice a day, a total of 15 tons.

Leaving Akron I went to Fort Wayne, arriving there May 29. I'll never forget that day. I really was a sick man. Every store seemed to have a mechanical produce rack. So we started on a program of selling ice for these mechanical cases. That really was a tough assignment but within a short time we had sold ten of them.

In October we started selling produce cases and in 19 working days I was able to install 17 produce racks. It's hard work, but it can be done.

The first thing to do is to meet with the produce dealers and wholesalers. At such a meeting I set up a produce case and showed them how ice protects the produce. They were amazed at the fact that fresh vegetables would keep seven or eight days in one of these produce cases. Shortly after this meeting one of the produce houses telephoned a tip that resulted in sales of cases to two grocers.

The second thing to do is to meet with the grocers. I was on the Food Council program and gave a talk that really went over big. Fully half the grocers in that audience have bought ice, either for the mechanical cases or produce racks in their stores.

The third thing is to stock up with at least ten cases. When you have that many on hand you'll go out and sell them.

Selling Ice Through Vending Machines

L. L. SWARTZ
Irvington Ice & Fuel Co.,
Indianapolis, Ind.

A COUPLE of years ago we decided to follow the trend and bought and installed an ice-vending station. Based on its results we installed nine more this past year.

I believe you have to have enough vendors to justify setting up a department for them, for their management takes time and thought. The ice has to be delivered in an insulated, refrigerated truck, and protected from the air. Our stations are located on main roads leading out from the center of town, in conjunction with filling stations.

We allow the filling station 25 percent discount from the retail price, which is 25 cents for a 25 pound package of crushed ice and 60 cents per 100 pounds for block ice. The filling station pays the electric bill and keeps the place cleaned up.

They fill the belts and we deliver the ice to the station and take care of any mechanical repairs. We bill them by the month for the ice provided. Our contract provides for leasing the station to the operator for a year for a dollar and we sell them the ice at our regular price less 25 percent discount. This yields $7.40 at the plant for the ice, with expense of bags, bagging and delivery, service, taxes, amortization of the stations deducted.

From these ten stations we sell slightly more block ice than we do crushed ice. It runs about 54 percent for block and about 46 percent for crushed ice.

Ice Protects Blood on Way To Wounded Americans

ICE has been one of the major keys to success in our armed services' high-speed shuttle of whole blood across the Pacific to wounded Americans. So declared a U. S. Defense Department spokesman recently in describing the process by which supplies of the life-saving fluid reach Korea.

Blood is gathered from donors throughout the country by the Red Cross and moved via air, rail or truck, under ice refrigeration, to Travis Air Force Base near Fairfield, Calif. Here it is lab-checked and treated with ACD preservative solution, the whole process taking about 14 hours. Then the bottles are again placed under ice protection for their long overwater trek.

The blood is packed in either of two sizes of cartons at Travis: a 24-pint-capacity wooden box (Army) or a 16-pint fiberboard box (Navy). The latter type is expendable. A separate inside carton holds a circular wire rack into which the bottles fit. In the center of this rack is placed the cooling unit, a round metal container filled with 20 pounds of ice. Fiberglass insulation between the inner and outer cartons makes the unit an actual ice refrigerator. The 16-pint unit, fully loaded, weighs only 87 pounds.

Airborne in MATS transports (300 pints is a normal load), the blood is flown to Hickam Field, Honolulu, thence to Wake Island, Guam and Korea, the entire crossing requiring less than 48 hours. Re-icing always takes place at Wake and Guam, but can often be omitted during the Honolulu stop. Since the blood would go bad within three weeks even under ideal refrigeration, its complete movement from donation center to hospital enjoys Class I priority.

The ice-cooled cartons were developed late in World War II after lengthy experimentation. No mechanical refrigeration method that would do the job as efficiently could be found. Ice has also proved most economical for this purpose; only about 15 tons is required for the 8,000 pints shipped to Korea monthly.

New York Ice Concern Closes

THE House Ice Company, Malone, N. Y., announced that it would close February 15 because of the price freeze and rising labor and transportation costs. The company has sold about 4,500 tons of ice a season.

Canadian Ice Companies Increase Prices

INCREASED wages and rising costs have forced price increases on ice in Canada. Officials of several major companies have raised the price one cent for each 25 pounds. A director of the Belle Ewart Co., Toronto, said that there had been only two "minor" increases in ice prices within the last ten years.

The following summary made up from a questionnaire sent out by the Canadian Association of Ice Industries shows the new ice prices as of January 31 for leading Canadian ice distributors.

	Delivered Price		Cash and Carry	
	50 Lbs.	100 Lbs.	50 Lbs.	100 Lbs.
Brantford, Ont.	.30	.60	.30	.60
Cornwall, Ont.	.30	.60	....	....
Dresden, Ont.	.30	.60	.30	.50
Galt, Ont.	.30	.60	.30	.50
Grimsby, Ont.	.30	.55	.30	.50
Hamilton, Ont.	.30	.55	.25	.40
Kitchener, Ont.	.30	.60	.20	.40
London, Ont.	.30	.60	.30	.50
Moncton, N.B.	.35	....	.35	....
Montreal, Que.	.30	.60	.20	.40
Niagara Falls	.30	.55	.30	.50
Oakville, Ont.	.30	.60	.30	.50
Oshawa, Ont.	.30	.60	.24	....
Ottawa, Ont.	.30	.50	.30	....
St. Catharines	.30	....	.25	....
St. Thomas, Ont.	.30	.60	.30	.50
Sarnia, Ont.	.35	.60	.30	.50
Saskatoon, Sask.	.30	.60	.30	.40
Sault Ste Marie	.50	1.00	.40	.60
Stratford, Ont.	.30	.60	.20	.40
Strathroy, Ont.	.40	.80	.40	.80
Toronto, Ont.	.32	.64	.30	.60
Truro, N. S.	.30	.50	.30	.50
Windsor, Ont.	.40	.80	.40	.70

City Products Corp. Announces Promotions

CHANGES in the administrative and executive staff of City Products Corp., Chicago, have been announced by William J. Sinek, president.

Robert W. Croker, currently vice-president in charge of the company's Cleveland division, is being moved to Chicago to direct the company's commercial ice operations.

Glenn H. Genger, who has been assisting in the ice and fuel operations in Chicago will take over the company's liquid and solid fuel division.

Walter A. Franz, formerly president of the company's Pilsener brewing division, has been made general manager of the company's brewery operations. Replacing Franz will be George C. Carter. B. C. Hoag, formerly secretary and treasurer, has been made Pilsener vice-president.

The Ice Industry

Market for Specialty Ice

IN ALL industries there are changing trends which smart operators recognize and to which they gear their selling strategy. This is not to say that their basic product promotion suffers in any way, but their endeavour is to increase volume by expanding their markets. The ice business is no exception. Our basic product is block ice, but there are strong indications that the use of ice in other forms is rapidly increasing.

This trend is not alone in the commercial field. Many ice companies in Canada have reported that sales of ice cubes and crushed ice to households have been unusually brisk during the entertainment seasons. Homes with electric refrigerators are particularly good prospects for no mechanical refrigerator can produce enough ice cubes to keep a party supplied.

It is said that apartment houses, and homes in "exclusive" neighborhoods are especially good prospects for the ice dealer. Let us do all we can to promote the sale of block ice and ice refrigerators, but keep plugging also for ice sales to food stores, hotels, restaurants and private homes, hotels, restaurants and private homes. —Canadian Ice Letter.

Receiver Appointed for Rhode Island Ice Co.

A PETITION for receivership has been filed against the Rhode Island Ice Co., Providence, R. I., by Walter B. Chaffee of East Providence, owner and present holder of first mortgage five percent sinking fund bonds of the corporation, and also a stockholder.

Raymond Wilbur of East Providence was appointed temporary receiver by Judge G. Frederick Frost in Superior Court, with bond of $25,000. Hearing on appointment of a permanent receiver was assigned to February 14. Suits during the receivership were enjoined.

In his petition, filed by George A. Saxon, counsel, Chaffee said the corporation had refused to pay him the principal sum and accumulated interest payments in the total sum of $320,856 due and unpaid on account of the bonds, and was insolvent in that it was unable to meet its current expenses and obligations as they became due and payable.

The temporary receiver was authorized to carry on the business pending the permanent receivership hearing.

Reports from Unit Ice Associations

Oklahoma Association Ice Industries Annual Meeting

THE annual convention of the Oklahoma Association of Ice Industries held at Oklahoma City January 21-23 attracted a good attendance of members, associate members and guests. The presence of associate members, 18 different companies being represented by 30 representatives, was especially gratifying.

The speaker for the convention banquet, the Hon. Johnston Murray, Governor of Oklahoma, outlined his administration's plans for attracting additional industry to Oklahoma, and reiterated his pledge of fighting for economy in the state government.

Guy W. Jacobs, director public relations department of the National Association of Ice Industries, discussed the work and plans of the association and described the advertising program for 1951. The Department still needs funds, he said, to provide a complete, well-rounded campaign.

Panel discussions were held on declining ice tonnage, economy of operations, diversification, selling in 1951, building a sales force, and sales promotion. These were led by C. E. Simmon, and C. E. McClintock, and presented by Guy W. Jacobs, Walter McGee, John B. Mills, Cooper Andres, Paul Liebman and W. D. Beard.

Ford Harper, managing director of the Oklahoma State Chamber of Commerce gave an interesting address on business problems and the 1951 legislature.

The following officers and directors were elected:

Officers and Directors

President, Clarence Page, Purcell, Okla.

Vice-presidents, Earl Johnson, Oklahoma City, Okla.; C. D. Payne, Lawton, Okla.

Treasurer, C. E. Simmon, Oklahoma City, Okla.

Secretary-Counsel, Harry Hudson, Oklahoma City, Okla.

Directors: K. F. Addison, Tulsa; C. F. Anderson, Oklahoma City; Paul H. Andres, Oklahoma City; W. D. Beard, Ponca City; P. R. Cooper, Clinton; Fred Fink, Tulsa; T. N. French, Oklahoma City; Charles Fry, Waynoka; Ralph Hood, Guthrie; M. M. Klein, Tonkawa; Paul Libmann, El Reno; E. C. McClintock, Bartlesville; Walter McGee, Tulsa; Marvin Mills, Oklahoma City; W. B. Moran, Oklahoma City; Laurence Voelkers, Oklahoma City.

New England Ice Association

RAY T. WILBER, Exec.-Secy.

THE New England Ice Association's annual convention will be held at the Sheraton-Biltmore Hotel in Providence, R. I., Wednesday and Thursday, April 11-12. Our convention has not been held in Providence for several years, and the hotel offers excellent facilities, the exhibit hall being a large lobby off the ballroom where the meetings will be held. The program is now being lined up and we hope to have a good attendance. Exhibit space will be provided for the industry suppliers.

Delta States Ice Association

R. N. MILLING, Secretary

THE Delta States Ice Association sponsored the National Ice Marketing Institute Field Course under the direction of Jake Ruppert. Mr. Ruppert formerly with the National Association of Ice Industries is now with the Vocational Department of the Department of Education, Little Rock. The "school" opened Monday, February 12 at the Hotel Heidelberg, Baton Rouge, La. Seventeen ice men enrolled for the course and a graduation luncheon was held Saturday, February 17, at which time certificates were presented to those successfully completing the course.

A spring meeting was held at the Hotel Bentley, Alexandria, La., February 22. Other spring meetings are scheduled to be held at Allison's Wells, Way, Miss., March 15 and at Hotel Marion, Little Rock Ark., March 22.

Missouri Valley Ice Manufacturers Association

V. A. ESPHORST, Secretary

THE Spring Meeting of the Missouri Valley Ice Manufacturers Association Merchandising Forum will be held Tuesday, March 27, at the Missouri Hotel in Jefferson City, Mo. A program that will be of interest to all Icemen in this area is being prepared by Chairman J. M. Cunningham of the Sedalia Ice & Cold Storage Company, Sedalia, Mo. All ice men, particularly those interested in selling, are invited to be present at this meeting.

Members and guests of Oklahoma Association of Ice Industries at annual banquet.

Canadian Association Holds Mid-Winter Ice Conference

A MID-WINTER ice conference of the Canadian Association of Ice Industries was held in the Royal Connaught Hotel, Hamilton, Ontario, January 31. There was a record attendance of 71 delegates which is the largest number to attend such a conference in Canada.

The morning session opened at 10:00 a.m. with Vice-President Staples in the chair and the program was devoted to merchandising. Messrs. Thompson and Bowie introduced the topic of refrigerator selling and special Ice contracts. A lively discussion followed with the Renfrew Electric & Refrigerator Co., Ltd., Sanderson-Harold Co., Ltd. and General Steel Wares Limited, all ice refrigerator manufacturing companies, outlining the supply situation for 1951.

John Leeds introduced the topic of vending machines and C. C. Hillmer, chairman of the Advertising Committee of the Association outlined the proposed advertising program for 1951.

The morning session closed with Past-President Wilkins introducing the topic of sized ice and ice cubes. The meeting adjourned for lunch at 12:30 wherewith T. G. Rogers as Chairman introduced J. E. T. Dade who addressed the luncheon on the topic "World Conditions as They Affect The Ice Industry."

The afternoon session, under the chairmanship of J. Webster, dealt with the subject of labor relations, including wages, working conditions, social benefits, personal training of men and building morale.

At this conference three new members signed up and the delegates felt that the conference was so worth while that another one should be held during April, which everyone present promised to attend.

Booklet Tells How Ice Preserves Beverage Flavor

A NEW booklet designed for distribution to present and prospective ice users, explaining briefly how Iceman's Ice preserves the original flavor of all chilled beverages has been issued by the Public Relations Department of the National Association of Ice Industries. It consists of eight pages and is printed in two colors. It is suggested that ice dealers will find this a valuable piece to distribute to supplement the national ice advertising campaign. They were expected to be off the press March 1.

New Northwest Secretary

THE Northwest Association of Ice Industries has announced the appointment of L. F. "Lu" Marsh as executive secretary with offices at 1539 N. E. 37 Ave., Portland, Ore. He succeeds Ed. H. Shea, who resigned recently.

Mr. Marsh is well fitted to assume his new duties, since he is an active ice man, having been operating the Koldkist Ice Co., since 1932. He is still operating this company and expects to continue, he says. This company, he further states, is one of the few outfits that deal in nothing but ice. It is engaged in the ice business only, no cold storage, no fuel, no lockers, no ice cream, nothing but ice, and they are not at all discouraged about its future.

Before becoming an ice man he was in the ice machine business and is a refrigerating engineer. He originally expected to operate the Koldkist Ice Company as a sideline, but the ice business soon crowded the ice machine deal right out of the picture, and he has done nothing but operate this ice company since 1934.

Mr. Marsh is greatly impressed with the need and opportunities for an ice association in the Northwest and says he expects to help other Northwest members make the most of these opportunities.

Virginia Ice Manufacturers' Association

H. H. SNYDER, Secretary-treasurer

THE Virginia Ice Manufacturers' Association will hold its 36th annual convention at the Hotel Chamberlin in Old Point Comfort, Va., Wednesday and Thursday, March 21 and 22, 1951. Last year at our meeting in Charlottesville, Va., we had an attendance of approximately one hundred. This year we hope to have about the same number present.

The ice companies in the Tidewater Area are sponsoring three cocktail hours during the convention period. A tour to Williamsburg with luncheon at the famous and fashionable Williamsburg Inn has been planned for the ladies.

There will be professional entertainment at the banquet. Afterwards, everyone will be invited to gather at the Chamberlin's private club where there is continuous music and entertainment until after midnight.

Registration for the convention will begin at 10:00 a.m. March 21, and the convention will adjourn at 3:00 p.m. March 22.

The Ice Industry

Northwest Association of Ice Industries

L. F. MARSH, SECRETARY

THE annual convention of the Northwest Association of Ice Industries will be held Thursday and Friday, March 29 and 30 at Vancouver, B.C. Details of the program are already planned and we can promise that all ice men who attend will get ideas that will make profits more certain in 1951.

The Vancouver boys know how to put on a convention that is worth going to, and present plans indicate this one will be the best that has been held so far. As regards entertainment, those who have been to conventions in Vancouver before do not need to be told that they will have a good time.

There will be no speakers outside of the ice industry, but there will be plenty of good, practical talks from ice men who will tell about things in the ice business that all ice men need to know and that will make the figures on the profit side of their balance sheets bigger. After each speaker there will be a period for questions and discussion.

The convention will be unofficially opened Wednesday evening, March 28, with a get-together that alone will be worth making the trip. Wednesday noon there will be a meeting of the board of directors. A lot of business is to be taken care of and all directors are earnestly requested to be present.

The Northwest ice men always take their wives to the convention and at Vancouver the ladies really come into their own. For them there will be planned shopping ventures, explorations in china shops and tearooms and other places.

Saturday, March 31, is scheduled for the start home and for this a trip has been planned through some of the gorgeous British Columbia country with plenty of time for sightseeing, dining, and other recreation.

Northwest Secretary Resigns

ON ACCOUNT of ill health, Ed. H. Shea has resigned as executive secretary of the Northwest Association of Ice Industries. Mr. Shea had served in that position since February, 1950. He will be succeeded by L. F. Marsh, with offices at 1539 N.E. 37th St., Portland, Oregon.

Practical Refrigerating Engineer

NATIONAL ASSOCIATION PRACTICAL REFRIGERATING ENGINEERS

Alvis Clay, Memphis, Tenn.

Second Vice-President, National Association Practical Refrigerating Engineers

NEWS

OPERATING

MAINTENANCE

QUESTIONS -- ANSWERS

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Treasurer
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H. B. BRANHAM, *Pocatello, Idaho*

EXECUTIVE OFFICE
EMERSON BRANDT, *Secretary*
435 North Waller Avenue
Chicago 44 • Illinois

Research Points Way to Modern Storage Practice for Fruits

A. LLOYD RYALL

Senior Horticulturist, Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, U. S. Department of Agriculture, Fresno, Calif.

MODERN" is a word of relative meaning. When applied to civilization it might mean a period of 200 years, whereas when applied to feminine styles it would in all probability refer to a period of only a few months. In this discussion of fruit storage practices it refers to a period of perhaps 25 years. During this period there has developed a realization that there is an optimum storage environment for each commodity and that the requirements for one product or even one variety may differ considerably from those of another.

This awareness of the inherent differences of commodities in their response to storage conditions, together with a vast amount of applied research aimed at the determination of the ideal temperature, relative humidity, air movement, and ventilation for each product and intensive study of supplementary treatments for delaying aging, controlling physiological disorders, and reducing decay, has resulted in the storage practices referred to, herein, as modern. There is no intent to infer that these practices are the ultimate, for storage research will continue to develop information on commodity responses and refinements in storage facilities and practices will result.

Storage Practices for Specific Fruits

Apples

Storage temperatures of 30 to 32 F. and relative humidities of 85 to 88 per cent are generally recommended for apples (17) although it is recognized that a few varieties from some producing areas are subject to low-temperature disorders and for best results should be stored under somewhat different conditions.

It has become increasingly evident during the past few years that the rate of cooling to storage temperature is an extremely important factor in the storage life of apples. Hukill and Smith (10) stated that Delicious apples cooled to 32 F. in seven days and then held continuously at that temperature had a storage life expectancy of 200 days, whereas those cooled to 40 F. in seven days, held at 40 F. for 21 days, and then cooled gradually to 32 F. in 28 days had a storage life of only 137 days or about the same as Delicious held continuously at 36 F.

Delay in the cooling of apples is not entirely a matter of inadequate refrigeration capacity, uneven air distribution, or poor stacking in the cold storage plant since delays often occur in moving the harvested apples from the orchard to storage. Van Doren and Skodvin (24) found that 42.8 per cent of more than 14,000 boxes of Red Delicious apples observed in the Wenatchee Valley during the 1948 season were delayed for more than 24 hours between harvest and arrival at the storage platform.

This probably represents a considerable improvement over earlier seasons as the necessity for moving Delicious apples into storage promptly has received much publicity during the past 10 years. The importance of delivering a crisp and palatable Delicious apple to the consumer has been more widely recognized as the production of this variety increased. Prompt storage, rapid cooling, and correct storage temperatures are now accepted as fundamental to the maintenance of dessert quality.

Presented to 41st NAPRE Convention.

Pears

Results of experimental work with fall and winter pears consistently show that for maximum storage life this fruit should be held as close to 30 F. as the temperature can be maintained. A relative humidity of 85 to 90 per cent in the storage atmosphere is satisfactory. For shorter storage periods 32F. is adequate for pears. Temperatures in the 35 to 40 F. range are very undesirable for such varieties as Bosc and Flemish Beauty. These varieties will not ripen at such temperatures and very soon lose their capacity to ripen even when moved to an environment favorable for ripening (5).

It is also generally recognized that pears have a rather definite storage life, and when they are moved to favorable temperatures during that period normal ripening will occur (1, 8). Fruit stored beyond this time may appear perfectly normal upon removal from storage; but instead of ripening normally the flesh remains hard, the skin turns brown, and the flavor typical for the variety does not develop. The normal storage life of the common varieties grown on the Pacific Coast, when promptly cooled to 30 F. and stored at this temperature continuously, is approximately as follows: Bartlett, 60 to 80 days; Bosc 100 to 120 days; Comice and Flemish Beauty, 120 to 130 days; and Anjou and Winter Nelis, 180 to 200 days.

Grapes

Table varieties of vinifera grapes produced in California are commonly stored for periods of several months. A storage temperature of 30 to 31 F. and a relative humidity in the range of 85 to 90 per cent are recommended (14). The successful storage of vinifera grapes has been made possible largely through the development of the sulfur dioxide fumigation process (15).

Treatment of grapes with one per cent SO_2 immediately after packaging followed by retreatment with .2 to .25 per cent for 20 to 25 minutes at weekly or 10-day intervals during storage will give satisfactory control of gray mold, the principal cause of storage rots in grapes, except in cases where many pre-harvest infections have occurred during heavy rains or prolonged periods of damp weather. Sulfur dioxide fumigations also have a beneficial effect in maintaining brightness and green color in the stems and cap-stems.

Most fruits are injured by SO_2 at the concentrations used for grapes and therefore should not be stored in rooms with grapes. The fumigant is corrosive to metals and corrosion-resistant paints for exposed metal surfaces are probably a profitable investment in plants where it is used regularly. The gas is taken up by water. Therefore, in brine spray plants the brine should be tested for acidity at frequent intervals and neutralized when necessary. Sulfur dioxide at the concentrations used for grape fumigation is highly toxic to humans and precautions must be taken to avoid exposure by workmen in the plant.

The SO_2 should be cleared from the room promptly at the end of the fumigation period either by aeration or by circulating the storage air through water sprays. Both methods are used satisfactorily in California grape storages, but the washing method appears to be gaining in popularity.

Table varieties of California grapes harvested at the proper maturity, cooled promptly, and stored at 30 to 31 F. with periodic fumigations can be stored satisfactorily for the following periods:

Emperor, Almeria (Ohanez) and Ribier (Alphonse Lavallee) 3 to 5 months

Malaga, Red Malaga (Castiza), and Cornichon (Olivette Noir) 2 to 3 months

Thompson Seedless (Sultanina), 1 to 2½ months

Flame Tokay and Muscat of Alexandria, 1 to 1½ months

Eastern (Labrusca) grapes cannot be stored for such extended periods as some of the vinifera varieties can, but Lutz (12) reported that sound, promptly cooled grapes of the Concord, Niagara, Delaware, Catawba, Worden, and Moore Early varieties can be stored successfully for periods of 3 to 8 weeks at temperatures of 31 to 32 F. and relative humidities of 80 to 85 per cent. These varieties are generally more susceptible to injury by SO_2 than the vinifera varieties, and the use of SO_2 as a storage fumigant is not recommended. Lutz obtained some decay reduction without perceptible injury by using a small amount (6 gm. per 8-quart basket of grapes) of sodium bisulfate in the packaging materials.

Lemons

Lemons are stored rather extensively in southern California and their special storage requirements have been studied over a considerable period in the producing areas. This fruit, in common with many other subtropical and tropical fruits, is subject to low-temperature disorders and cannot be stored for more than a few weeks at temperatures below 50 F. The recommended temperature is 55 to 58 F. at a relative humidity of 85 to 90 per cent (17). Lemons which are dark green to light green in color when stored can be held as long as six months under these conditions. The more common storage period, however, is one to four months.

Harvey (9) reported that lemons picked during January and February had better keeping quality than those picked during the period from March through May. He also reported that color and condition of the stem buttons during the storage period was a good index for predicting the decay break (development of serious Alternaria decay). Darkening of the buttons, as a result of Alternaria infection, occurs somewhat in advance of invasion of the internal tissue of the lemon by the fungus and Harvey suggested that plotting a curve of button changes at several inspections during storage might make possible a rather accurate prediction as to the storage life of any particular lot of lemons.

The control of rots by supplementary treatments is important because of the relatively high storage temperature, and various methods of reducing decay development have been devised. Antiseptic dips of sodium carbonate or sodium hypochlorite solution applied prior to storage are used in some instances and experimental work has indicated some benefit.

Klotz (11) compared a number of gases as fungicides for the control of common citrus rots and concluded that nitrogen trichloride had greater possibilities than any of the other gases tried. He reported that concentrations as low as four to six mg per cubic foot for a period of 30 minutes were lethal to conidia of blue and green molds, and Alternaria citri. He stated that rots in oranges were reduced 50 to 75 per cent by giving the fruit three to five three-hour treatments with 5 to 15 mg of $N Cl_3$ per cubic foot of air, at three or four-day intervals and suggested that if lemons were tolerant to low concentrations of $N Cl_3$ the treatment might be used to advantage during storage.

More recently Pryor (16) reported satisfactory control of blue and green molds in lemons during storage by the application of frequent dosages of nitrogen trichloride at low concentrations in the storage atmosphere. He reported that the commercial application in lemon rooms is one to four mg of $N Cl_3$ per cubic foot of storage space for 4 hours repeated three to seven times a week. This treatment has prevented the spread of blue and

green molds to adjacent sound fruits from fruits infected prior to storage.

Stewart (22) recently reported favorable results from pre-harvest sprays or post-harvest applications of small amounts of 2,4-D or 2,4,5-T. These growth-regulating compounds kept the stem buttons green and alive and thereby materially reduced the incidence of alternaria rot, a serious cause of loss in stored lemons which is associated with black button.

Oranges

Oranges are not generally considered suitable for long storage, but experimental work conducted during the past three seasons by Harding (7) and Wiant et al (25) indicated that Florida Valencia oranges harvested during April and May can be successfully stored for two to three months at 31 to 32 F. and a relative humidity of 85 to 90 per cent. Other investigators had previously recommended storage temperatures of 36, 38, and 45 F. largely because of the tendency of oranges to develop pitting, brown stain and watery breakdown at the lower temperatures.

However, recent investigations indicate that the greater amounts of blue and green molds and stem-end rot developed at temperatures above 32 F. more than offset the slight losses due to physiological disorders. Harding stated (correspondence) that 10 carlots of Florida Valencia oranges were stored commercially at 31 to 32 F. for periods of two to three months during the past season and that the results were very satisfactory.

The use of fruit wraps or box liners impregnated with a diphenyl compound has been found to reduce the development of rots during the storage period. On the other hand, there is some evidence that the ethylene treatment as used for degreening oranges prior to packing somewhat increases their susceptibility to decay.

Grapefruit

Grapefruits are much more susceptible to low-temperature disorders than oranges and serious pitting and scald will develop when they are stored for more than two or three weeks at temperatures below 45 F. Although a storage temperature of 32 to 34 F. has been recommended (17) where stem-end rot is prevalent, recent investigations by H. B. Johnson and Ryall (unpublished) in Texas indicated that although some losses occur from stem-end rot at the higher storage temperature, the total spoilage after eight to ten weeks of storage and a seven-day marketing period was much greater in fruit stored at 32 or 38 F. than in that stored at 52 F.

Some progress is being made on methods of controlling decay at the higher storage temperature and the commercial storage of selected lots of Texas grapefruit for periods of two to three months at 52 F. and 85 to 90 per cent relative humidity appears to be feasible.

Stone fruits

Peaches, apricots, plums, and sweet cherries are not adapted to long periods in cold storage, but some varieties of peaches and plums can be stored for three to four weeks with satisfactory results. A temperature of 31 to 32 F. and a relative humidity of 80 to 85 per cent are recommended for all of the stone fruits (17), but under the most favorable conditions sweet cherries, apricots, early peaches, and soft-fleshed plums should not be stored for more than one to two weeks.

Air Movement and Refrigeration

The rapid removal of field heat from the commodity and the maintenance of uniform temperatures throughout the stacked product in the storage room have become increasingly important as storage seasons for given commodities are lengthened and consumers become more quality conscious.

Rapid removal of field heat is accomplished primarily by: (1) Precooling prior to placement in the storage room; (2) increasing the air movement in the storage room and using stacking practices designed to permit free movement of air past all the packages; and (3) increasing the refrigeration capacity and cooling surface. Air can be directed for the maintenance of uniform temperatures in the room by: (1) Well-planned placement of duct openings; (2) periodically reversing the flow of air; (3) using a system of baffles to prevent short circuiting of air; or (4) using an injection system whereby the air velocity is increased from the duct by restricting the opening.

Sainsbury (18) published an excellent description of the newer storage systems for apples and a discussion of the reversed-air and injection systems. Edwin Smith, a colleague of Sainsbury, pointed out (correspondence) that the adjustment and balancing of a reversed air system are extremely important, and he suggested that contracts for installation of such a system should require satisfactory adjustment before acceptance by the operator.

The use of sulfur dioxide in the storage of grapes has resulted in the development of air-distribution methods particularly adapted to plants designed for grape storage. The most common of these is the individual-room coil-bunker system with direct expansion coils on one wall of the room, a baffle in front of the coils, and fans at the top of the baffle to pull the air over the coils and across the top of the room. In larger rooms air from the fans is moved across the room in individual ducts and released at the far wall. Some of these installations have water lines above and drains below the coils so that water can be sprayed over the coils for the dual purpose of defrosting them and clearing SO_2 from the storage air.

The original cost of the coil-bunker system is somewhat greater than that of the centralized brine spray ducted-air system, but the coil-bunker system has the advantage of more flexibility in that each room is a separate unit and can be held at any desired temperature or gassed independently of the other storage rooms.

Another development which should be mentioned is the use of ice as a refrigerant in cold storage plants. A number of ice refrigerated plants have been built in the stone fruit and grape districts of California in recent years. The usual arrangement includes individual ice bunkers for each room with fans at the top of each bunker to draw air through the ice and circulate it through the room. The investment for such a plant is considerably lower than that for a mechanically refrigerated storage, and, although the operating cost per ton of refrigeration is probably somewhat higher in the ice refrigerated plants, there appears to be a place for these plants where only one or two products are stored and the total storage period is only three to four months in any one year.

Supplementary Treatments

Air purification

Investigators of fruit storage problems have been aware for many years that certain fruits, particularly apples and pears, evolve products after harvest which affect ripening rate and the development of storage disorders such as surface scald. It has also been recognized for a long time that odors produced by some commodities have an adverse effect upon the flavor of other commodities stored in the same room. In an attempt to remove part or all of these volatile and odorous

constituents from the storage air a considerable amount of experimental work has been done in recent years with adsorbents, particularly activated coconut-shell charcoal.

Experimental results on the effect of circulating storage air through canisters containing activated coconut-shell carbon are not in entire agreement as to the possible benefits derived.

Gross and Smock (6) demonstrated that activated carbon was effective in removing a pine odor contamination resulting from pine wood volatiles and other introduced volatiles such as ethyl acetate and ethyl malonate and the volatiles from geraniol.

Smock and Southwick (21) later presented evidence of partial control of surface scald, lengthened storage life, and reduction of storage odors in stored apples. These benefits were attributed to removal of ethylene and other volatile emanations from the storage room air.

Van Doren and Bullock (23) reported satisfactory surface scald control and one to two months of added storage life with several varieties of apples and pears from the use of activated carbon in the storage room.

However, Gerhardt (4) demonstrated that ethylene is not removed from the storage air by activated coconut-shell carbon and his determinations of volatiles other than ethylene in some commercial installations showed that the quantity of these volatiles was not appreciably reduced below that in rooms without air purification filters. In small experimental rooms he did find that volatiles other than ethylene were reduced by about two-thirds as a result of air filtration through activated carbon.

On the basis of firmness, soluble pectins, and scald development, early picked Bartlett pears kept somewhat better in carbon-purified air than in untreated air at comparable temperatures. However, Bartlett pears of both early and late pickings lost their capacity to ripen normally at about the same time when stored in either normal or purified air. Surface scald on early picked Delicious apples was reduced somewhat in intensity by air purification, but the results obtained by Gerhardt indicated that neither the storage life nor the dessert quality of Red Delicious, Golden Delicious, or Jonathan apples was improved significantly through the use of activated carbon. Anjou pears of both early and late pickings likewise showed no benefit from air purification.

It appears, on the basis of results reported to date, that rather effective removal of storage odors can be obtained by passing the storage air through activated coconut-shell charcoal and that some reduction in surface scald can be expected. Whether the storage life of fruits can be extended sufficiently to justify the initial investment and operating costs of an air-purification system remains to be proved by additional experimentation.

Controlled Atmosphere Storage

The possible benefits to be derived from increasing the carbon dioxide concentration and decreasing the oxygen content of storage air have been studied extensively both in this country and abroad. The possibilities which have been considered principally by investigators are: (1) Use of modified atmospheres at temperatures of 36 to 40 F. to store satisfactorily varieties which are subject to physiological disorders when held at 31 to 32 F.; and (2) extension of the storage life of popular varieties which store satisfactorily at low temperatures but for which a longer marketing season is desired.

Results obtained by Allen and McKinnon (2) with California Yellow Newtown apples and by Smock (20) with New York State McIntosh apples indicate that these varieties, which are subject to low-temperature disorders (internal browning and brown core) when stored at 32, can be held successfully for extended periods in modified atmospheres at 38 to 40 F. California Yellow Newtown apples kept best in an atmosphere of 10 per cent carbon dioxide and 10 per cent oxygen at 40 F., but Smock recommended 5 per cent carbon dioxide and 2.5 to 3 per cent oxygen at 38 to 40 F. for New York McIntosh.

Mattus (13) reported that Bartlett pears stored in 9 per cent CO_2 and 3.5 per cent O_2 at 33 F. kept for 206 days and had a longer shelf life at room temperature when removed from storage than Bartletts stored for 84 days in normal air. Budiselich and Van Doren (3), reporting on Golden Delicious and Red Delicious apples held in small chambers at 31 F., stated that both varieties maintained crispness and flavor for a much longer period in atmospheres of 2 per cent O_2 and 5 per cent CO_2 or 2 per cent O_2 and no CO_2 than when held in normal air at the same temperature.

The use of modified atmospheres for fruit storage involves the construction of gastight rooms as well as the installation of special air-washing and gas-determining devices. These costs, in addition to regular refrigeration ones, have been estimated by Smock (20) to be 10 to 12 cents a bushel per season. The added expense of modified-atmosphere storage has slowed its commercial acceptance, but Smock (correspondence) stated that a number of relatively small modified-atmosphere storages (total capacity about 150,000 boxes) have been constructed in the East and for the most part are in successful operation. At least one or two new units have been constructed during the past summer.

Ozone

Ozone has at various times been credited with reducing fruit decays, preventing mold growth on containers and storage room walls, sterilizing storage room air, controlling surface scald in apples, and eliminating undesirable storage odors. However, experimental work with ozone under controlled conditions has indicated that, while ozone is useful in some circumstances, its beneficial effects in fruit storage rooms are rather limited.

Gross and Smock (6) showed that ozone was much less effective in eliminating volatiles from pine boxes, chemicals, and apples than filtration of the air through activated carbon. Schomer and McCulloch (19), from an extensive study of ozone in apple storages, concluded that the chief values of ozone are the maintenance of a pleasant atmosphere in the storage room and the control of surface molds on packages and walls. They did not obtain commercial control of apple scald, comparable with that obtainable by the use of oiled paper, by daily exposure of the fruit to 2 to 3 ppm of ozone but the percentage of scald was less in the ozonized lots than in the untreated.

Fruit decay was not eliminated by ozone at these concentrations, but it appeared that new infections during the storage period were reduced by the fungicidal effect of ozone on spores in the storage room air. Apples were injured by daily applications of 3.25 ppm of ozone, and the flavor of all varieties tested except Golden Delicious was impaired by this treatment. No adverse effect upon appearance or flavor was noted from daily applications of ozone at 1.95 ppm. Concentrations of 2 to 3 ppm of ozone are irritating to workmen, and for this reason ozone generators should be operated only during the period when there are no workers continuously in the room.

Experimental work with supplementary treatments is in progress in many places and new materials and processes for improving the keeping quality of fruits in storage will doubtless result.

NAPRE Department

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N A P R E

Question Box

H. G. Venemann, Professor of Refrigeration, Purdue University and chairman of NAPRE Educational Committee, answers members operating problems monthly in this column. Send questions to Chairman H. G. Venemann c/o Purdue University, West Lafayette, Indiana.

Booster — When?

Question No. 874: When a part of the plant load is at 0 F temperature and the remainder is carried at 20 F, is it more economical to have the low temperature load placed on a booster compressor? The 0 F load is 22 tons and the 20 F load is 43 tons refrigeration on an ammonia system.—L.B.J.

ANSWER: The question does not state whether the 0 F and 20 F temperatures refer to the room temperatures, or to the temperatures of the evaporating ammonia; therefore, I will assume that they refer to the room temperatures and that the evaporating temperatures are —17.2 and 5.5 F respectively for the 22 and 43-ton loads. I will also assume a discharge pressure of 185 psig corresponding to 96.2 F liquid. We will compare the horse power requirements of two systems.

System No. 1 will consist of a 22-ton compressor, operating between 5 psig and 185 psig, and a 43-ton compressor operating between 20 psig and 185 psig. In both cases, the ammonia will leave the condenser as a saturated liquid, leave the evaporator as a saturated vapor, and enter the compressor with approximately 9 degrees of superheat.

The weight of ammonia handled by each compressor will be as follows:

$$\text{22-ton compressor} \quad \frac{22 \times 200}{606 - 150.8} = 9.66 \text{ lb per min}$$

$$\text{43-ton compressor} = \frac{43 \times 200}{613.5 - 150.8} = 18.56 \text{ lb per min}$$

The theoretical indicated horsepower for this system is as follows:

$$\text{22-ton compressor} \quad \frac{9.66\ (764 - 610)}{42.42} = 35.0 \text{ tihp}$$

$$\text{43-ton compressor} \quad \frac{18.56\ (730.6 - 619)}{42.42} = 49.0 \text{ tihp}$$

Total tihp = 35.0 + 49.0 = 84.

System No. 2 will consist of a booster compressor operating on the 22-ton load between 5 psig and 20 psig. A 2nd-stage compressor will operate between 20 psig and 185 psig. A liquid and gas intercooler between the two compressors will cool the booster discharge gas, and all of the 96.2 F liquid to approximately 13.5 F by evaporating liquid ammonia in the intercooler.

The weight of ammonia handled by the 2nd-stage compressor will be as follows:

$$\text{From booster compressor} = \frac{22 \times 200}{606 - 57.6} = 8.02 \text{ lb per min}$$

$$\text{From 43-ton load} = \frac{43 \times 200}{613.5 - 57.6} = 15.45 \text{ lb per min}$$

From intercooler, by energy balance around intercooler, 5.04 lb per min

The total,
8.02 + 15.45 + 5.04 = 28.51 lb per min

The theoretical indicated horsepower for this system is as follows:

$$\text{Booster compressor} \quad \frac{8.02\ (641\text{-}610)}{42.42} = 5.86$$

$$\text{2nd stage compressor} \quad \frac{28.51\ (730.6 - 619)}{42.42} = 75.20$$

Total tihp = 5.86 + 75.20 = 81.06

System No. 2 will save 2.94 tihp over System No. 1.

Most of us do not want answers in terms of theoretical horsepower, but it is difficult to compute them on a basis of brake horsepower, because manufacturer's tables do not agree exactly on the power requirements of compressors. However, I am able to make the following comparison of the brake horsepower requirements for the two systems, with data I have at hand.

System No. 1

22-ton compressor $22 \times 2.42 =$ 53.24 bhp

43-ton compressor $43 \times 1.58 = 67.94$ bhp

Total, $53.24 + 67.94 = 121.18$ bhp

2.42 and 1.58 are better than average values of bhp per ton for compressors operating as in System No. 1. System No. 2.

22-ton booster $22 \times .6 = 13.2$ bhp

2nd stage $\frac{28.51}{18.6} \times 67.94 = 104.2$ bhp

Total, $13.2 + 104.2 = 117.4$ bhp

The only data I have available gives the brake horsepower of the booster under above conditions at 0.6 bhp per ton.

Since the 2nd-stage compressor handles 28.51 lb per min instead of 18.6 as in System No. 1, the bhp will be proportionately larger. System No. 2 should save about 3.68 bhp over System No. 1.

Figure 1 has been prepared to show the enthalpy values of the ammonia at the operating conditions specified in both systems. Figure 2 is a sketch which shows the weight rate of flow, and the enthalpy of the ammonia entering and leaving the intercooler in System No. 2. To compute, W, the lb per min required to cool the gas and liquid entering the intercooler, it is necessary to take an energy balance around the intercooler. This is done by making all of the energy which enters the intercooler equal to all of the energy which leaves it. The energy at any point is equal to product of weight and enthalpy at that point. The energy equation is: $(15.45 \times 619) + (8.02 \times 641) + (W + 23.47)$ $150.8 = (W + 23.47)\ 619 + (23.47 \times 57.6)$.

Solving this equation, we find that W is 5.04 lb per minute, and the total weight condensed is $(5.04 + 23.47)$ or 28.51 lb per min., as shown in Fig. 2. —H. G. Venemann.

Fluorine in Ice Water

Question No. 875: Our city is preparing to introduce fluorine into the water for the purpose of aiding in dental protection for the people. It seems to me that some question has arisen in connection with ice manufacture where fluorine treated water is used. Does the fluorine in the water reduce ice quality or make quality ice production more difficult? —O.M.D.

ANSWER: There have been reports that when fluorine compounds are introduced into the water there has been a greater tendency for ice made from that water to crack and shatter. General investigations do not corroborate this theory. Investigations by Burks (University of Illinois Bulletin 254) showed that chlorides increased the cracking tendency but the amounts had to be substantial in order to make cracking a problem. Fluroine belongs to the same family, halogens.

The amount of sodium fluoride added to water for dental protection is less than ½ part per million: General investigations indicate that this amount of fluorine would cause no difficulty if nothing else exists to create a greater than usual tendency to cracking.

If cracking troubles occur from any source the remedies recommended by Burks usually are effective. Briefly, in most waters, cracking can be prevented by treatment with ammonium sulphate, which should be applied in the lowest concentration that achieves results. Cracking prevention chemicals are supplied in convenient form by several companies catering to the ice industry.

Perhaps it is wise to repeat the usual recommendation. The first step when cracking occurs is to check the water treating equipment and methods and the results they obtain. When the water treating operation is at optimum, then the next step of specific chemical treatment to prevent ice cracking is in order.—Emerson Brandt.

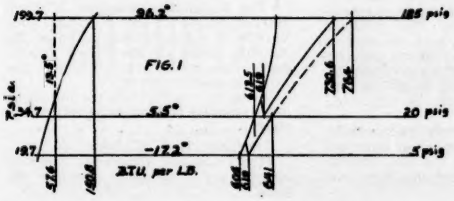
NAPRE Department

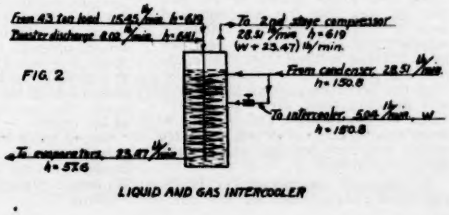
Split Tube

Question No. 876: We have a submerged single pass brine cooler in our 50 ton ice tank. In some manner one of the tubes was split open and brine was pulled into our ammonia refrigeration system. Could this single tube have frozen up and split or is it possible that the tube failed for some other reason? The ammonia pressure was 15 psi and the brine temperature was 12 F at the time. What density or freezing point would you recommend for the brine in this tank which usually has a 12 to 15 F temperature?—A.C.F.

ANSWER: We are of the opinion that freezing of brine in the tube is not the main contributing factor in tube failure. This opinion is based on the fact that the Henry Vogt Machine Co. have built many "Tube-Ice Machines" which make ice by freezing water inside of tubes. This machine produces a batch of ice every (approximately) thirty minutes and operates continuously and automatically over long periods of time without tube failure.

The question by A.C.F. did not state the kind of brine or concentration, therefore, we assume that a too low concentration of calcium brine was in use. With this condition it is possible for the brine to freeze and damage the tubes. However, there are other contributing factors such as low velocity or foreign material in the tube which would promote local freezing. The fact that one tube only failed in the large nest of tubes indicates faulty material or local conditions which caused the tube to fail. It is hard to understand how the brine could be drawn into the ammonia side of the system when the





operating pressure is 15 psig; in fact, it should be the reverse with ammonia being discharged into the brine.

The question No. 876 is vague as to findings, however, the above mentioned possibilities should point to factors contributing to tube failure. The specific gravity of 15 deg. calcium brine should be 1.20, which would have a freezing point (when still) of minus 7.5 deg. To produce this concentration it would require 2.2 lbs. of anhydrous calcium chloride per gallon.

The (ACRMA) Equipment Standards published by Air Conditioning and Refrigerating Machinery Association, Inc. recommends that the brine mix have a freezing point (when still) of approximately 20 deg. F below average brine temperature.

A bulletin published by The Dow Chemical Co., Midland, Michigan, contains valuable information on calcium brine, etc.—E. A. Edmonds, Henry Vogt Machine Co.

New Questions

Drop Tubes Ice Up

Question No. 877: During the winter months in our ice plant we have much trouble with balls of ice freezing on the air tubes placed in the center of our ice freezing cans to agitate the water as it freezes. This ice accumulation stops the flow of air and the ice blocks are not clear. What would you recommend to remedy this difficulty?—J. N.

Condenser Tube Corrosion

Question No. 878: We have a horizontal shell-and-tube condenser cooled with well water at 57 F which is not recirculated. We find that about 5 years is the life of the tubes which corrode at the welded ends. The condenser connections are arranged so that the water drains out of the condenser when its supply pump is stopped. Do you believe there would be any benefit in changing the connections so that the condenser is full of water at all times?—R.W.C.

Tube Coatings, Other Remedies

Question No. 879: In the case of corrosion around the welded ends of the condenser tubes do you think some type of coating as mentioned in discussion of Question 861 would be effective? We have only the one condenser shell and it is in use all the time. Thus there is a problem of drying the tubes quickly before the coating is applied. Have you any suggestions on this?—R.W.C.

News Notes and Chapter Activities

Memphis

By Charles Conley

ALL of us learned a great deal from the talk on Maintenance of Electric Motors and Controls given by John Thrithart, General Electric Co., at the first meeting of the period. His subject was divided into three sections dealing with cleanliness, proper lubrication, and correct materials for repairs and replacements. For instance, heating elements must be the proper type and rating in order to give the same protection for the motor that the original parts did. The same thing is true of fuses. Lubrication, he said, must be adequate but should be properly applied and there should be no excess because this extra grease or oil will find its way into the windings and lead to deterioration. Mr. Thrithart stressed the use of proper replacement brushes secured from the manufacturer of the motor because otherwise the brush may prove unsuitable and increase wear. Keep the motor clean he emphasized and protect it from accumulation of grease and dust which produces heating and brings early breakdown.

At the next meeting Harry Walling, York Corp., talked on low temperature refrigeration. He discussed the various refrigerants used in low temperature service and the types and kinds of refrigerating machines. The systems were drawn on the blackboard and Mr. Walling gave sample calculations to show how the different hook-ups compared in efficiency and other factors.

The operation of cold storages and the duties of an engineer in such plants were described by Charles Conley, superintendent, power plant and building for Memphis Cold Storage Warehouse Co. He gave a brief history of the development of the cold storage industry and described a modern plant and how it protects the perishable commodities placed in its care. Details were given of equipment operations and the methods which promote efficiency, as well as those that avoid breakdowns and loss of refrigerant. Reliability of operation, he said, is most important because the goods must be protected at all times.

The chapter welcomed to membership Norman Houston, chief engineer Broadway Coal and Ice Co., and R. W. Reeds, master mechanic Memphis Packing Co.

Fresno

By M. Pedersen

The refrigeration course under Thomas Hagar continues with a thorough study of the lecture course. At our most recent meeting Mr. Hagar presented the facts about the various refrigerants. The group showed considerable interest in brine and a number of questions were presented on this subject.

President Lancaster appointed committees to handle the different divisions of the work. They are: Educational Committee, T. R. Hagar, M. G. Campbell, K. W. Findley, C. E. Spillsbury and J. C. Bryant. Membership Committee, M. G. Campbell, M. Pedersen and K. W. Findley. Auditors, C. E. Spillsbury and C. C. Lovejoy. Entertainment Committee, C. P. Shupe and M. Pedersen.

Tacoma

By C. W. E. Johnson

In the annual election the current officers were returned for another year of service. They are:

President, L. E. Hasse
Vice President, Clarence Mase
Secretary, C. W. E. Johnson
Educational Chairman, J. A. Slater. Membership Chairman, W. D. Vanderflute, Social Chairman, E. Branscomb.

The special speaker at the meeting was Mr. Arthur of Mueller Brass Co. He had a number of samples of their products for display and described how they are manufactured and used.

Yakima

By Elmer Toop

An interesting review of the national convention was presented by National President, Howard Peterson. We learned about the numerous engineering papers presented at the convention. Now we are looking forward to their publication so we will have them available for reference. The members showed their interest by asking a large number of questions. Because of limitations of time the business meeting was postponed and the election will be held at the next meeting.

San Jose

By Fred Byl

THE educational course is continuing under the direction of Prof. Harold Hayes of Santa Clara University. His good presentation of the subjects gives all the chapter members much information they can use in their work.

In the annual election the following officers were elected to serve during 1951:

President, L. C. Watkins
Vice President, Joseph W. Sullivan
Secretary-Treasurer, Gordon W. Rose

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Cleveland.The Cleveland Brewers Supply Co.
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R. I.—**Providence**.....Borden & Remington Co.
TENN.—**Chattanooga**.Southern Products Co., Inc.
Nashville.....John Bouchard & Sons Co.
TEXAS—**Dallas**.....Barada & Page, Inc.
El Paso.....H. J. Baron Co.
Houston.....Barada & Page, Inc.
San Antonio...Westbrook Carb. Elec. Co.
UTAH—**Salt Lake City**.....Louis A. Roser Co.
VA.—**Norfolk**.....Refrigeration Supplies, Inc.
Richmond.....A. R. Tiller Corp.
WASH.—**Seattle**.....Van Waters & Rogers, Inc.
Spokane.....Van Waters & Rogers, Inc.
WISC.—**Milwaukee**.....Reichel-Korfmann Co.

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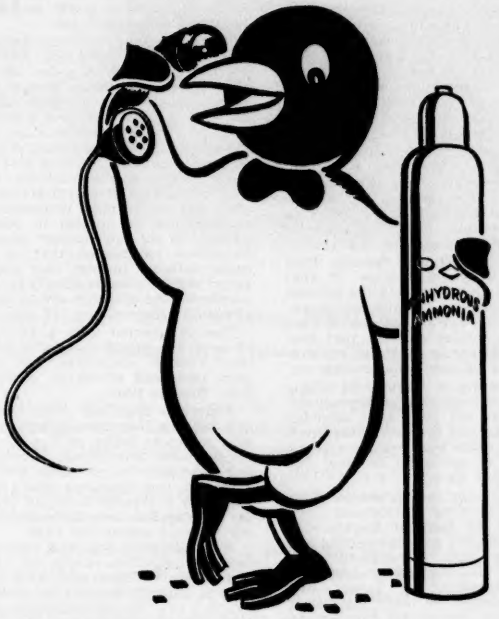

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Du Pont "National" is 99.99% anhydrous ammonia . . . always uniform . . . always dependable . . . always dry. Use it to keep your refrigeration equipment operating at maximum efficiency.

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INCORPORATED
WILMINGTON, DELAWARE

...also Distributors of "Artic" Methyl Chloride... Sulphur Dioxide... Kinetic "Freon"

New Orleans

By Leo Vivien

The 1951 officers were installed on January 10 as follows:

President, Louis Howat

First Vice President, Bartholomew Mancuso

Second Vice President, James Chaisson

Third Vice President, Nathan Forrest

Treasurer, George Whitman

Secretary, Leo Vivien

Financial Secretary, Eugene Orth

Sergeant-at-Arms, Joseph Vernaci

Educational Chairman, Frank Chase

Board of Directors: Frank Gillio, Chairman, Thomas Holloway, Bernard Graff, Walter Bernard, Jr., Murray Bellinger and Damian Fischer.

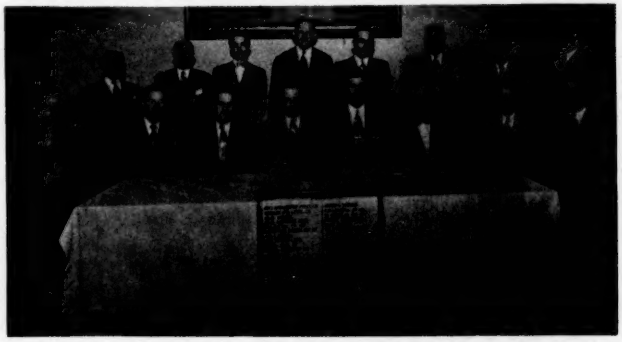
The meeting was well attended and concluded in a nice sociable gathering with refreshments and trimmings. All the officers pledged their efforts toward increasing the membership and promoting better educational and social programs for the year.

As an educational feature Paul Kalman, assistant director of civil defense in this area held the interest of the members intently while explaining the various phases of civil defense activities and the part that our members may be called upon to perform in the event of an emergency.

The meeting of January 24 falling right in the beginning of the carnival season was not very well attended but we attribute that to the fact most of us are quite busy with the social activities so prevalent in New Orleans at this time.

However, our newly elected Educational Chairman introduced John Taylor of the General Electric Co., who presented a very interesting and instructive talk embellished with slides on "Application of Electrical Heat in Industry." Mr. Taylor's discussion brought out many interesting facts on the use of this heat in the refrigeration industry.

Our Educational Chairman, Frank Chase, promises us a very good program this year.



New Orleans Chapter Officers, Front Row—Jos. Vernaci, Leo Vivien, B. J. Mancuso, Louis Howat, James Chaisson, Geo. Whitman, E. W. Orth, Frank Chase. Back Row—Ed Ford, Damian Fischer, Walter Bernard, Jr., Murray Bellinger, Bernard Graff, Tom Holloway, Frank Gillio, Carl Brindell who was installing officer.

Los Angeles

By Fred Herr

LOS ANGELES Chapter introduced an innovation in preliminary class technique at its January 17 meeting that proved to be an unqualified success. In his dual capacity as chapter president and class instructor for 1951, George Paulick of California Consumers Corp. used the first meeting of the new year to introduce a plan of guest instructors for the preliminary class.

At this meeting the guest instructor was Kenneth N. Robertson, sales engineer of the Los Angeles office of the Pacific Scientific Co. With the collaboration of Tom Grayson of the same firm, Robertson gave a demonstration and talk on the Alco glass evaporator. A demonstration unit was set up in the meeting room and permitted those in the audience actually to see the refrigerant action and gave them a thorough understanding of superheat as applied to thermal valves. In his introductory remarks Robertson commented that he was quite flattered to note that experienced refrigeration engineers far outnumbered the students among the 50 persons in the hall.

The experiment with a guest instructor was highly successful. President Paulick announced that more such programs would be presented from time to time.

Sixty-five members answered roll call for the business session, which was called to order at 8 p.m. Five guests were introduced. Immediate Past president Dale Rycraft, the 1950 president, was presented with a wrist watch as a chapter token of regard for his excellent administration during national convention year.

W. R. Burnett reported on membership committee plans for 1951. The "plans," it developed, were quite simple. Burnett intends to make it five in a row. He pointed to the 1947-1948-1949 pennants, and the 1950 plaque, on the wall, and remarked, "Let's make it five of a kind, boys."

A truly noble first prize is being offered to produce action in the 1951 chapter campaign. Burnett announced that the first person to sign up ten new members will have his railroad fare paid to the 1951 NAPRE convention and will receive in addition $25.00 expense money. Don Byl and V. A. Stubblefield, who ran one-two in 1950, will have some keen competition this year, judging by the commentary that followed Burnett's announcement.

Mr. Rycraft gave a general report on what the educational committee has on the fire for 1951. There will be two field trips, or plant inspections, several quiz programs, one or two panel discussions, with the balance of the schedule filled out with representative speakers.

Mr. Quinn reported that the new public relations committee has set itself the task of making NAPRE better known in Southern California. He said the committee was established because it was felt that not enough people know about NAPRE, that if news of the chapter's worthwhile activities were disseminated more thoroughly, a larger and better organization would result.

The speaker of the evening was Hayes T. Cory, chief engineer of the Los Angeles office of the Baker Refrigeration Corporation. He spoke on "Present Trends in Ammonia Compressors."

The Chapter staged one of its well-known and popular quiz programs as the feature of its educational session on the night of February 7. Dale Rycraft, Jr., chairman of the educational committee, had named Capt. Herb Royden as moderator for the program, the subject of which was "Refrigerating and Electrical Machine Repairs."

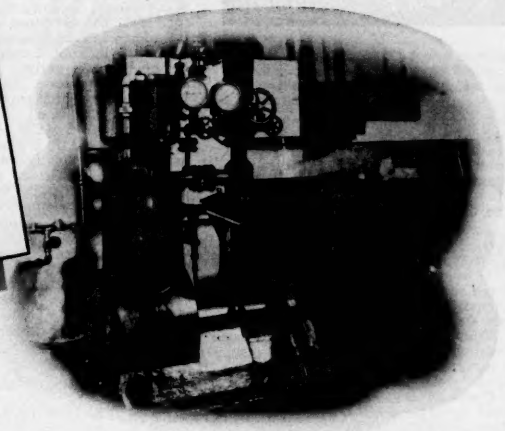
The panel of experts upon whom devolved the task of supplying answers to questions fired from the membership at large consisted of the following: Art Bender of Bender Machine & Engine Works; Vernon Dwire, plant manager, Los Angeles factory, Double Seal Ring Co.; W. I. Meador, sales engineer of the same firm; Rudi Kettler, sales engineer, Fairbanks, Morse Co., and Donald Byl, refrigeration engineer of the Union Ice Co.

Capt. Royden asked each panel member how long he had been active in his industry, and came up with a total of 131 years of experience: Bender—27 years; Dwire—20; Kettler—34; Meador—20, and Byl—30.

Due to the circumstance of questions asked from the floor, it developed that the greater part of the period was devoted to discussion of piston ring problems. On this subject, Mr. Dwire and Mr. Meador were able to offer the chapter some valuable information and advice, not only on the ring products produced by their own firm, but on piston ring matters in general.

One lengthy discussion dealt with why piston rings in refrigeration plant equipment sometimes wear lop-sided. This question was asked in connection with rings in a vertical machine. Forty minutes later the debate on this subject was still going strong and a mass of good information has been passed along about

There's something of this
OLD WORK-HORSE
in every Vilter Compressor

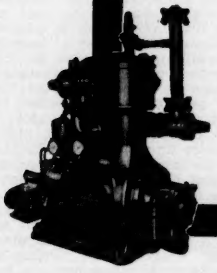


You Get Advanced Design and Precision Manufacture Now —but the Stamina and Reliability Haven't Changed a Bit

Things have changed a lot in refrigeration since this 1900-model Vilter Compressor was installed—but the old girl is still running, and most of her original parts are still with her. Refrigeration engineering and design have advanced, styling has changed. But the Vilter concepts of painstaking care and honesty in manufacture are as strong as ever.

Ask owners of Vilter Compressors, and they'll tell you that they have less trouble . . . spend less money on their Vilters, whether the machines are 10, 20, or 40 years old. The reduction in wear, the careful balance of elements that make these records possible are engineered and *built* into every Vilter Compressor from the frame casting on up.

Vilter's experience from the beginnings of commercial refrigeration is available to you through your Vilter representative. He can show you how to get more efficient refrigeration with Vilter equipment, and he'll stay with you later and show you how to keep it that way. Get in touch with him now.



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bronze insert rings, disc rings, bronze coated rings and their respective values, qualities and durability.

Capt. Royden explained how some bronze-coated rings made as an experiment had served well for several seasons, except that they did not seat evenly all around. Mr. Dwire explained how it is possible to wear a ring till it is actually smaller than the diameter of the cylinder.

As the various discussions proceeded, Mr. Royden, as moderator, interpolated with examples of piston ring experience that he had encountered, or of which he had heard as occurring in other sections of Southern California.

When the piston ring question had been given a thorough going over, a number of other questions on electrical plant problems were tackled.

The business session was presided over by President George Paulick. Five new members were initiated, indicating that Ray Burnett's membership committee is slowly but surely getting to roll toward that second leg on the National Membership Plaque (the first leg was nailed down in 1950).

Burnett reported that in addition to a first prize of a free trip to the 1951 national convention, plus $25 in pocket money, two other substantial prizes would be offered in the local chapter drive. The free railroad fare will be paid to the member who first signs up ten new members this year.

Frank G. Muzzy, chairman of the attendance committee, read a letter which it is proposed to send to the entire membership urging more frequent attendance at the semi-monthly meetings. Emmet T. Quinn, who early in February was in process of putting the finishing touches on the chapter's 1951 membership directory, regarded Muzzy's letter as so fine a piece of work that he said it will be published in the directory.

Fishermen as well as golfers will be able to display their prowess during the coming summer. Frank Eccleston reported that sentiment among members seems to favor staging an NAPRE golf tournament this summer. He suggested that ideas along this line be submitted at the March meeting and that if sufficient interest is indicated, a tournament committee be appointed to handle it.

Sports item No. 2 came from Frank Hooper who declared that the two deep sea fishing trips staged last summer apparently were not enough to handle the crowd. He proposed that four or five trips be arranged this year during the albacore season. He asked that those planning to attend, advise him of their preferential dates so that he can make arrangements with the owners of the boat.

Incidentally, Frank contends that ICE & REFRIGERATION done him an injustice on Page 43 of the December, 1950, issue, in which Frank is pictured hauling in an **eleven** pound albacore. "It weighed 22 pounds," said Frank.

The Blair Memorial Project, its present status and prospects for the future were reported on by Mr. Quinn. There will be no problem of getting the building materials, Mr. Quinn said, in relaying information brought back recently from Washington, D.C., by Art Hess, originator of the memorial idea. Because the project is of educational value, there will be no trouble getting materials to build the proposed Blair Memorial Library and Refrigeration Research Laboratory at the Frank Wiggins Trade School in Los Angeles, Mr. Quinn reported. It is proposed to call a meeting of the committee in the near future to discuss such matters as project cost, fund raising ideas, and when construction can be started.

The refrigeration preliminary class was conducted between 7 and 8 p.m. by Class Instructor George Paulick. The guest instructor was E. W. "Gene" Smith of the C&S Equipment Co., Los Angeles. It was a continuation of discussion about thermal expansion valves and pressure regulations.

Stockton-Modesto

By R. M. Edger

The 1951 officers of the chapter are:

President, John Panizza
Vice President, W. E. Minkkinen
Secretary, R. M. Edger
Sergeant-at-Arms, Ray Munoz
Board of Directors: H. W. Hedburg, C. C. Berkley and W. R. Greenstreet.

The educational committee is divided into two groups. The Stockton meetings are in charge of Hank Enns, W. R. Greenstreet and H. W. Hedburg; while meetings in Modesto are arranged by C. C. Berkley, E. L. Young and Roy Ashcom.

The entertainment committee consists of Dennis Desjardin, Stockton and Roy Ashcom, Modesto. The Membership Committee is composed of the following: E. L. Young, C. L. Trower, John Bauer, Dennis Desjardin, Thomas Woods and O. M. McConnell.

Problems of insulation for ice tanks and cold storage rooms were discussed by H. W. Hedburg who pointed out that it is easier to check subsurface frosting when the structures are built on the ground if coils are embedded in the sub-floor. He pointed out that it is not practical to insulate so that there is no chance of frost heaving. Mr. Hedburg recommended that condenser water be circulated through the coils to offset heat loss through the insulation.

The discussion created much interest because it showed how to avoid troubles which have been encountered in low temperature installations on the ground. We have welcomed two men to membership: W. R. Nehring, Modesto and Frank Sitton, Ceres. A good year is expected in our operations. All of the committees are at work in cooperation with our officers and good interest is being shown in our programs.

At the following meeting a discussion of plant problems was scheduled and the meeting demonstrated the value of cooperative work among the members on such matters. For instance, a water valve which would not work was brought to the meeting by C. L. Trower. A number of suggestions were made by the different members to solve the difficulty. Later when the valve was re-installed it operated satisfactorily.

Rio Grande Valley

By Armin Doneis

PRESIDENT Haley announced that instructor John Muller would be prevented from taking part in the next few meetings because of activities in the Reserves which he was unable to decline. In his stead Angus Casberg was named temporary instructor by acclamation. Mr. Casberg accepted this appointment gracefully with the proviso that Slim Haley should preside over the Question Period. There being no further official business the meeting proceeded with the Question Period.

The question period dealt with the problem of one member who reported operating two similar ice tanks in the same plant under identical operating conditions and pulling schedule, which had hitherto operated at practically identical brine temperatures but had lately shown a four degree difference and noticeably lower production on one. In the absence of adequate thermometers to measure the amount of superheat in the suction of the warmer tank, it was considered difficult to ascertain whether that one was starving for liquid due to a stuck float-valve or a plugged strainer screen. Since the concentration of brine had been found unusually low it was suggested that a film of ice probably covered the lower portions of the evaporator coils and hindered heat transfer.

Others inquired whether an accumulation of oil in the evaporator might be responsible, whereupon it was reported that the matter of oil contamination had been pretty thoroughly investigated and dealt with. Mr. Casberg suggested that bringing the brine up to 80° Salometer reading might make an appreciable difference in operation and said it was good practice to check the brine every thirty to sixty days. He reported the need to add about five tons of salt every sixty days to his 1300 can tank to keep the brine strong enough to assure safety from freezing and reduce corrosion attack. The value of proper instruments for measuring temperatures at strategic points was emphasized in view of the fact that information so gained might eliminate the need of tearing into a costly insulation job on the float control valve and associated connections in order to inspect the strainer and valve mechanism in search of possible cause of trouble.

Accident prevention during plant maintenance and operation was the topic of discussion for the instruction period, and Mr. Casberg spent considerable time to good advantage to go into the details about thoroughly pumping out equipment prior to opening it for inspection or repairs. Replacing badly rusted ammonia flange bolts while under pressure by means of C-clamps was also described by Mr. Casberg as an acceptable expedient in an emergency.

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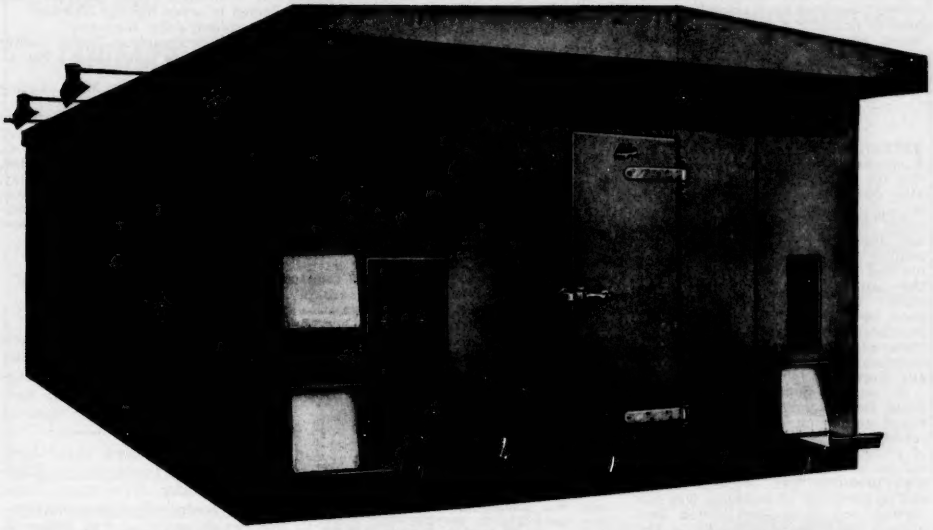

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1. Lower freight costs.
2. Proportional station widths.
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6. Compact refrigeration unit, with automatic defrost.

POLAR vending stations and vendors are built to last a lifetime. Long life and trouble free operation is very important in any capital investment.

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We send one of our engineers to supervise installation of all complete POLAR vending stations at no extra cost to you.

Get your vending stations lined up now. Take advantage of the extra volume possible during the spring months.

We invite you to visit our factory, and inspect our installations in Minneapolis and St. Paul, the ice vending capital of the world.

Write today for prices and specifications

REFRIGERATION ENGINEERING COMPANY

"Pioneers in Refrigeration"

MONTGOMERY MINNESOTA

N A P R E Department

Proper makeup of pipe fittings and pipe threading procedure also came in for some discussion, as did also precautions in handling electrical portable tools and cords, and the need for secure grounding. It was suggested at the close of the session that during the next session in which we will conclude this study of accident prevention, that each member prepare to tell of his pet scheme or pet peeve concerning accident prevention.

Chicago

By E. B. Jones

PRESIDENT Les Clifford has adopted a new type of meeting notice for the chapter which has created fine interest and attention. In an informal manner he gives news about the chapter and membership and highlights the features of the coming meeting. In addition it summarizes the educational program of the last meeting. Experience has shown that the Clifford method is good because the last meeting was presented to a full house. Apparently those who had been missing the good programs decided they wouldn't miss any more.

At the first meeting of the month Doug Benton presented the educational course on the subject of receivers. First he described the types of systems which dispense with receivers or use very small ones with high pressure float. Modern design and construction of receivers was reviewed and then Mr. Benton explained their operating functions. He stressed the fact that receivers should be protected by relief valves and went on to a discussion of purging and the hook-up which would facilitate full removal of non-condensables.

A report on the national convention was presented by Emerson Brandt. He gave details from the engineering papers presented there and went on to describe refrigerating plants visited on inspection trips. The questions that followed showed interest in the entertainment features of this Hollywood convention, as well as in the engineering program.

The engineering course at the next meeting was handled by Gene Rytlewski. He described unusual applications of receivers in tight places. He used blackboard sketches to show how good effective systems have been installed to meet special requirements and get around limitations in space.

Sizing and layout of high and low pressure steam lines was analyzed by Ed Gaarnas. He emphasized the difference between the two types of lines and told how to avoid difficulties in their operation.

When temperatures are brought down near absolute zero materials and substances change character, Averill Cole reported to the meeting. Copper wire loses its resistance to the flow of electricity and some liquids climb uphill he explained in recounting the interesting developments when practically all heat is extracted.

A new design of ice accumulator which provides high cooling capacity to meet peak loads in dairies and other users of water cooling was discussed by Robert Redlich, Buildice Co. Mr. Redlich told how the refrigerating equipment in off peak periods can be employed to freeze and store ice. Because of special design of the equipment these "Buildicers" can melt this ice rapidly to chill process cooling water. Thus the overall size of refrigerating equipment is reduced and yet peaks in capacity are fulfilled.

San Francisco

By N. O. Tice

San Francisco Chapter scooped other engineering societies with its program devoted to the work of the Local Disaster Corps. In the present emergency it is wise to give thought to public and personal safety in the face of any general emergency that might develop.

Information on local steps to develop a program of this type was given to the chapter by Battalion Chiefs William H. Gilmore and Jesse McLindon. Mr. Gilmore is an expert on refrigeration and he discussed the handling of refrigerant gases and liquids in case of a major disaster in the city. Mr. McLindon told how plans for emergency activity have been arranged. He said that they will depend upon the voluntary support of numerous organizations and individuals. The chapter was requested to organize an advisory committee on refrigerants to point out specific dangers and suggest certain emergency plans and procedures to the Disaster Council.

On February 14 Prof. J. N. Thompson, San Francisco City College began the class on refrigeration engineering which has created broad interest as a fine opportunity for engineers to increase their knowledge and ability. This will be more fully reported later. Plan to be at every meeting. Set aside the second and fourth Wednesday for this purpose.

Tulsa

By M. A. Coffey

TULSA Chapter emphasizes that it has everything new. We have a new meeting place which we like, a good new program and expect a good year of activity. Through the cooperation of the People's Ice Co., we are meeting in quarters over their display room on First Street between Denver and Cheyenne. The new officers elected to serve during 1951 are:

President, John Wiseman
First Vice President, Henry Turner
Second Vice President, W. C. Downing
Secretary-Treasurer, M. A. Coffey
Sergeant-at-Arms, R. K. Wyatt

Directors: George Koehne and Nate Axton. Educational Committee, B. L. Stewart, John Wiseman and W. C. Downing. Membership Committee, K. G. Wight, and Thomas Henry. Safety Committee, George Koehne, Henry Turner and Nate Axton. Social Committee, Bob Palmer, Edmond Schultz and M. A. Coffey.

Franklin Institute Forms Asphalt Research Center

A NATIONAL Asphalt Research Center for research and development to serve the asphalt industry in the United States has been established by the Franklin Institute Laboratories.

Among the sponsors were: Armstrong Cork Co., Lancaster, Pa.; Flintkote Company, New York City; Owens-Corning Fiberglas Corporation, Toledo, Ohio; The Paraffine Companies, Inc., San Francisco, Calif.; Sinclair Refining Company, New York City; and Sun Oil Company, Philadelphia, Pa.; Western Molded Products, Inc., Los Angeles, Calif.

Second Midwest Regional Conference

A ONE-DAY refresher conference on refrigeration plant operation and maintenance will be held in St. Louis Saturday, March 31. The program will feature talks by Professor H. G. Venemann of Purdue University, and Emerson Brandt, Technical Editor of Ice & Refrigeration and Secretary of the National Association of Practical Refrigerating Engineers.

The meeting is to be sponsored by the St. Louis Chapter of the N.A.P.R.E. but membership is not required for attendance. It will be a round-up of refrigerating engineers throughout the Midwestern states and will be held in the Kingsway Hotel conveniently located on the west side of the city.

According to Don Watkins, N.A.P.R.E. Educational Chairman, the program will emphasize especially the problems of refrigeration plant operation during this period of shortages resulting from the world crisis. A panel of leaders in the refrigeration field will be prepared to answer questions of concern to the practical operator. Professor Venemann is nationally known for his success in educational work among practical plant operators, and his lectures won high praise from delegates to last year's St. Louis conference.

L. V. Fleiter, Chairman of St. Louis Chapter N.A.P.R.E., has invited operators of refrigerating equipment in ice plants, dairies, breweries, packing houses, and other industries including air-conditioning installations throughout the area to take advantage of this refresher in up-to-date plant practice.

Out-of-town engineers can obtain information on registration and reservations from E. G. Bishop, House Committee Chairman, 4316 Duncan Av., St. Louis 10, Mo.

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- *EFFICIENT*
- *SANITARY*
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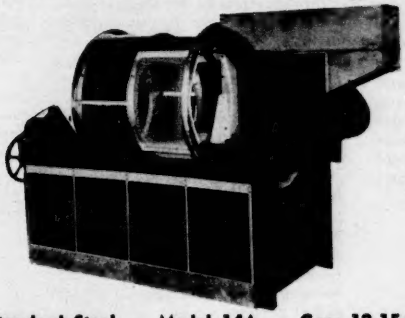

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Stainless or Standard Steel — Model 14A — Cap: 12-15 Tons Per Hour

This new Model 14A Lilly ICIZER is the ideal Sizer for low headroom vaults. Only 71½" high overall. Will produce a size of ice suitable for every need. Rugged frame constructed of heavy channel and angle steel—heavy galvanized screens and floor bins—assure long life—trouble-free operation. Can be furnished with either standard steel Breaker housing, or stainless steel, at small additional cost. The new slow speed Breaker, together with the easily operated hand lever adjustment add up to better control of sizes produced—*more saleable ice.*

Other models, with "B" type bagging bins and "CE" model with elevator and bagging bins can be furnished with capacities up to 35 tons per hour. Write or wire today for complete information and prices on Lilly ICIZERS.

LILLY CRUSHERS
Capacities from 10-35 tons/hr.
Write for Crusher Catalog

THE LILLY COMPANY
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Ice Tools
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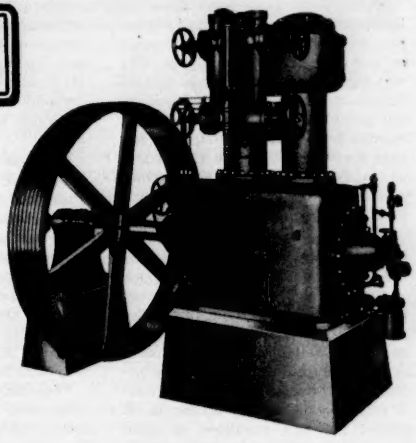
Sterling DEPENDABLE REFRIGERATION



The phrase "STERLING DEPENDABLE REFRIGERATION" is more than a slogan—it's a fact.

Built with rugged strength for endurance, with advanced design for efficiency and economy of operation, STERLING Ammonia Compressors are the product of more than fifty years of "know how" in the manufacturing of refrigeration machinery and equipment.

A complete range of sizes insures the correct compressor for each application.

Deliveries are, at present, current—most models of compressors are available from stock.

For complete information, see your nearest STERLING distributor, or write the factory.

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Adverse Weather Affects Ice Cream Sales

THE Ice Cream Sales Index for the first eight months of 1950 and in detail for the second four months of 1950 is the summary of the reports of 702 ice cream plants with sales in 1949 of 310,647,836 gallons. The details of the increases or decreases by months and by four-month periods and for the first eight months of 1950 in the United States follow:

Month	Percent Increase or Decrease
January	plus 5.45
February	minus 1.51
March	minus 3.67
April	minus 8.75
Jan. 1 through April 30, 1950	minus 2.92
May	minus 2.38
June	minus 6.78
July	minus 9.20
August	minus 5.23
May 1 through Aug. 31, 1950	minus 6.11
Jan. 1 through Aug. 31, 1950	minus 4.28

1950 sales continued to decrease throughout the United States, except for January, which had sales increases of 5.45 percent above January, 1949, and February's sales decrease was only 1.51 percent.

It has been thirty years since the ice cream industry had as bad a summer from the standpoint of weather as was had in 1950. The year 1920 was the last in which below normal temperatures were the rule throughout practically all of the first eight months of the year. In fact, there has been no other year since 1920 where as many as half of the summer months had temperatures below normal.

To further document the fact that the decreases in 1950 were largely due to the weather, during every one of the first eight months of the year there were at least some few states (and in some of these months a fair number of states) that had increases in sales for the month. Had the increase been due to poor business conditions rather than to weather, in all probability, this condition of some few states having increased sales in spite of a general increase for the whole country, would not have been true. This is particularly true of the months April, June and July with decreases in sales of 8.75 percent, 6.78 percent, and 9.2 percent, respectively. Decreases in sales of this size for the United States would, almost without exception, be followed by decreases in each one of the states had business conditions rather than subnormal temperatures been responsible for the decreases.

For the first four months, January 1 through April 30, the Central Eastern States had the largest decrease of 6.29 percent, followed by the North Atlantic States with a decrease of 5.04 percent. The Middlewestern States had an increase of 1.59 percent, the Southern States of 1.17 percent, and the Western States of 1.35 percent.

For the second four-month period, the Middlewestern States had the largest decrease of 12.09 percent, the North Atlantic States were next with 9.35 percent, followed by the Central Eastern States with 6.12 percent. The Western States again had an increase of 3.41 percent.

For the eight-month period, only the Western States had an increase in sales, namely, 2.15 percent. The Middlewestern States had the largest decrease, 11.56 percent, and the Central Eastern States were second with 6.15 percent.

Frozen Fruit Consumption Reaches New High in 1950

THE consumption of frozen fruits and fruit juices in 1950 reached a new high of about 4.1 pounds per capita, basis weight of the frozen product, the Bureau of Agriculture Economics reported. The 1950 consumption was a full half pound more per capita than in 1949. Credit was given largely to increased consumer demand for frozen fruit juice concentrates for boosting consumer usage.

The BAE officially reported the 1950 pack of commercially frozen fruits and fruit juices at a new record high of 770 million pounds, more than half again as large as the 1949 pack. Contributing strongly to this new record, BAE said, were substantially larger packs of frozen strawberries, cherries, and citrus juices. But packs of most other berries, peaches, and apples were considerably smaller.

"Especially noteworthy among the 1950 packs of frozen fruits and fruit juices," the BAE pointed out, "were the amazingly large increases in frozen citrus concentrates. Total output of such concentrates amounted to about 30 million gallons, 295 million pounds, about 2.4 times the 1949 pack and a new record. The pack of 25 million gallons of orange concentrate was a little more than twice the 1949 pack. The pack of about 1.7 million gallons of grapefruit concentrate was more than 14 times larger, and the pack of 1.3 million gallons of blended orange and grapefruit concentrate was more than 11 times larger. In addition, there was a large commercial pack of about 1.7 million gallons of frozen concentrated lemonade, compared with a small experimental pack in 1949."

Production of frozen concentrated orange juice in Florida was well underway from the 1950-51 pack by mid-January, the BAE said, with production to that date estimated at about three million gallons compared with two million gallons at the same time a year earlier.

A.W.A. Convention

(Continued from page 15)

sity of cooperating with the government in the preparedness program. There being no further business to come before the meeting, it was adjourned.

Convention Entertainment

THE people who attended the Boston warehouse meetings enjoyed themselves. All of them got better acquainted at the Boston "Tea Party" which concluded the affairs of the opening day, and gave a good start to the evening in which attendants visited notable eating places. The New England Warehousemen's Association gave the party.

The AWA Family Party had everything, including Burl Ives, who gave a selection of his favorites and some new ballads. The supporting cast was excellent in a well-balanced program. The orchestra used no tricks to keep the floor occupied with dancers. There was plenty of space in the Statler Ballroom and the people took enthusiastic advantage of it. The dinner was preceded by a social hour which drew full and enthusiastic attendance.

Preceded by the President's Reception, the 60th Annual Dinner was the final evening event of the convention. A surprise feature of the affair was a concert by the Harvard University Band. This accomplished group of 150 musicians gave a delightful program of diversified numbers.

Led by Mrs. Sherman Whipple Jr., the Ladies' Hospitality Committee utilized the many attractions in and around Boston to add special events for the ladies in attendance. Each day a special tour was arranged. Included, were a visit to the Harvard Botanical Museum, a concert, delightful teas and luncheons, and a trip to historic Concord and Lexington.

NIAGARA AEROPASS CONDENSER (Patented)

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Hundreds of engineers have been interviewed about their experience with the Niagara Aeropass Condenser. In one way or another, they say, "I wouldn't go back to anything else." And their managers, who watch the costs, say, "Best investment we ever made, couldn't operate now, without it."

Niagara Aeropass Condensers have three exclusive features which save trouble and money in running a refrigeration plant:

The "Duo-Pass"— keeps scale and salts from crusting the coils, keeps the condenser always at full capacity.

The "Oilout"— removes oil and dirt from the refrigerant, at the exact point where the oil vapor is condensed and the refrigerant is not.

The "Balanced-Wet-Bulb" control gives automatic operation at the minimum head pressure, saving power cost the year 'round!

In addition, the Niagara Aeropass Condenser saves nearly all your cost of cooling water, quickly bringing back to you the cost of installation. In plants where refrigeration is a production process, owners know that this condenser has reduced their costs.

Write for Bulletin 103.

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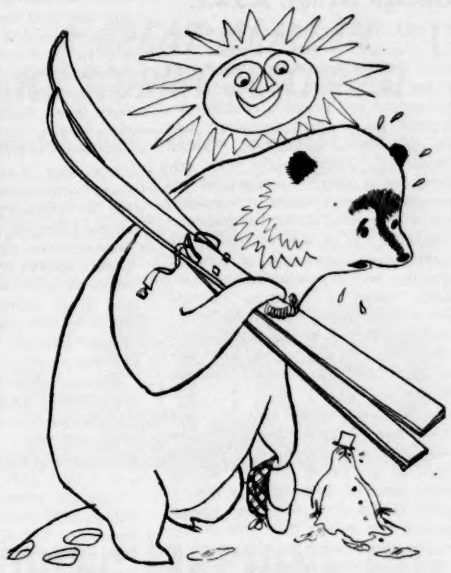

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Warm weather has a way of creeping up and catching you off guard. You just can't count on seasons changing according to calendar dates.

But you can count on Armour's Anhydrous Ammonia Service—it's real insurance against a sudden jump in temperature.

Armour's Ammonia is pure and dry, free of moisture and non-condensable gases and, to insure trouble-free operations, every cylinder is tested and checked before shipping to give positive assurance of fine quality.

Armour's 65 conveniently located stock points assure you prompt delivery of anhydrous ammonia where you want it—when you want it—and fast. Place your order today and you'll be ready for any sudden change in the weather.

Available in 50, 100 or 150 pound cylinders.

You can depend on Armour's Ammonia and Service

ARMOUR *Ammonia Division*

Armour and Company, 1355 W. 31st St., Chicago 9, Ill.

Chicago Section, A.S.R.E.

THE February 8 meeting of the Chicago section American Society of Refrigerating Engineers heard Del Albright who is chief development and research engineer for Automatic Products Company, talk on "Common Refrigerant Control Problems". Mr. Albright went beyond the ordinary discussion of expansion valve troubles and pointed out with lantern slides, the uses and characteristics of several basic types including the automatic or constant pressure valve, a standard thermostatic valve, a pressure limiting thermostatic valve, and finally he introduced a new thermostatic valve which incorporates an external adjustment for the pressure limiting feature.

In his preface remarks Mr. Albright said he felt the better showing that expansion valves are making today as evidenced by fewer valves being returned, is principally due to more technical knowledge among service men rather than due to the improvements made in equipment.

He stressed three points for improving sales and maintaining the best customer acceptance and satisfaction with controls. (1) With the end result in view, use the simplest control to accomplish the job; (2) Use standard sizes to keep costs down and make service convenient; (3) Old devices should be improved to meet new demands as technological advances in equipment designs and applications occur.

No Construction Racket

THE Research Council on Riveted and Bolted Structural Joints has been in existence only four years, but already the results of its work, particularly on the advantages of high-strength bolts instead of rivets in building construction, are becoming evident.

As W. C. Stewart, Chairman of the Council, pointed out in his report, "In the usual construction of a large office or apartment building or a hotel, the structural sections are bolted together temporarily and as the riveting progresses the bolts are replaced by rivets. Thus we have the expense of putting the bolt in, taking it out, and replacing it with a rivet. Money can be saved if the original bolt can be left in place, and studies by the Council indicate that this is a safe procedure if high-tensile bolts are used and if the bolt is properly tightened.

Mr. Stewart stated that a bolt may also be used to replace rivets in existing structures to prolong their useful life, and that the fatigue strength of a bolted joint is at least as good as, and in some cases better than, the fatigue strength of a riveted joint. Finally, "with bolted structures there need be no noise nor other physical side effects which may be a public hazard or nuisance in some locations."

An idea of the possible saving from the use of bolts instead of rivets can be obtained from the experience of the railroads of the United States in maintaining bridges; approximately 800,000 rivets are used in the repair of these structures each year, and it is estimated that $160,000 could be saved annually by the use of high-strength bolts for this maintenance.

Savings from the use of bolts in the erection of new buildings and bridges for which several million rivets are used would be more than a half million and might reach a million dollars each year, and it would completely eliminate the wear and tear on the nerves of all those who live in the vicinity of the new structure.—From report of Engineering Foundation.

Natural Ice Harvest Short

ICE harvesting has begun on a large scale in the Gouldsboro-Tobyhanna area Scranton, Pa., but the season's cutting will be only half of the estimated 120,000 tons produced last year. Officials of the West End Ice Co. and the Tobyhanna Creek Ice Co. reported ice thicknesses of from 10 to 12 inches.

Only 50,000 to 75,000 tons of ice will be cut by both companies due to a large supply of ice still in storage from last year's "cool" summer. The West End Ice Co., owned by R. A. Davis, Scranton - Wilkes - Barre coal and ice dealer, will limit ice cutting this year to its West End pond, it was announced. Sufficient ice from last year's harvest is in storage at the North Jersey plant, officials stated.

Business and Industry Expansion in 1951

BUSINESS and industry plan to spend 4.8 billion dollars for new plants and equipment in the first quarter of 1951, according to a recent bulletin of the U. S. Department of Commerce, Field Service. This would be 30 percent more than in the same period of 1950. If plans for the year as a whole are realized, 1951 capital outlays will be higher than in any previous year.

Lauren Seeley Elected President A.S.H.V.E.

THE election of Lauren E. Seeley, dean of the College of Technology and director of the Engineering Experiment Station, University of New Hampshire, Durham, N. H. as 1951 president of American Society of Heating and Ventilating Engineers was announced at the 57th annual meeting of the Society at the Bellevue-Stratford Hotel, Philadelphia, Pa. Dean Seeley succeeds Lester T. Avery, of Cleveland.

Lauren Seeley

Other officers elected were: First vice-president, Ernest Szekely, president of the Bayley Blower Co., Milwaukee, Wis.; second vice-president, Reg F. Taylor, consulting engineer, of Houston, Texas; treasurer, Howard E. Sproull, division sales manager, American Blower Corp., Cincinnati, Ohio. Officers were installed at the concluding session of the meeting.

Dean Seeley was born in Meriden, Conn., Nov. 8, 1898. He attended Yale University, where he received his Ph.B. degree in 1921, his M.E. in 1924 and an LL.B. in 1935. While preparing for his degrees he taught courses in mechanical engineering at Yale and in 1925 was put in charge of a course in heating and ventilating, remaining at the university until 1945 when he was appointed to his present position at the University of New Hampshire.

Controls Guide Issued by Journal of Commerce

A QUICK reference guide to regulations applying to control of commodities, prices, priorities, limitation or production orders has been issued as a supplement to the Journal of Commerce, New York. Its aim is to help the reader spot quickly all regulations applying to any specific commodity and to give a compact digest of each order.

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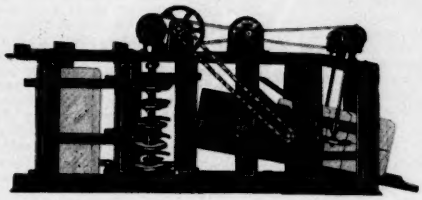
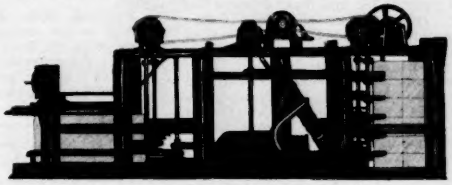


PERFECTION REGULAR

The Perfection REGULAR receives the ice block standing on end, scoring it crosswise first. Then the block enters the tilting cage which turns the block down and it slides by gravity through another set of saws that score it lengthwise. In one operation the REGULAR will score the blocks into any size pieces desired. This machine in 300 and 400 pound size, is 31 inches wide with saw guards in place, or 26 inches wide with saw guards removed. Capacity is six blocks per minute or 360 blocks per hour.



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The PERFECTION SPECIAL receives ice blocks on edge, scores them lengthwise first. Then heads up the blocks, scores them crosswise and discharges them standing on end. This is a combined heading and scoring machine and scores the blocks into any size pieces desired in one complete operation. Capacity is 4½ blocks per minute or 270 blocks per hour.

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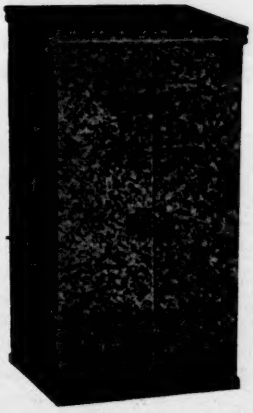

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Sales and Reorganizations

Huttig, Ark.—Lee Simpson has sold his ice business here to Clyde Sehon who has handled the affairs of the concern for Mr. Simpson for some time.

Folkston, Ga.—James F. Altman has purchased the truck re-icing and storage business from J. P. Hinson on U. S. 1, in the southern section of this city.

Danville, Ill.—Richard Beard, owner of the Beard Ice Company, announced the purchase of the Crystal Ice & Fuel Co., from Thomas J. Cossey.

Tiverton, R. I.—Roger E. Titus of this city has obtained the plant of the Crystal Ice and Cold Storage Co. Inc., consisting of a 1-story frame building with 54,650 cubic feet of storage space at 164 Riverside Drive, in a mortgagee's sale.

Newcastle, Ind.—The Consumers Ice and Fuel Co., 542 N. 12th St., purchased the ice business of the Burke Ice and Coal Co., 1550 Walnut Street, as announced by Harold R. Dailey, head of the Consumers firm. The sale affected only the ice business of the Burke firm and does not include the physical properties.

Greencastle, Pa.—Controlling interest in a 125,000 bushel capacity ice and cold storage plant here has been sold to Baer Bros., frozen food distribution firm of Hagerstown. The firm was incorporated in 1934. Situated on a seven-acre tract, its facilities include a three-story brick building with a storage capacity of 125,000 bushels and ice manufacturing equipment with a daily capacity of 28 tons; a one-story building containing 1000 individual food storage lockers; a processing building under lease to the Greencastle Packing Co., and a building under lease to the American Stores, Inc., containing cold storage space to a capacity of 100,000 pounds of meat.

Portland, Ore.—The Chip Steak Company of Oregon has purchased the Guenther Organ Co. at 2400 S.E. Holgate Street, and will put an estimated $100,000 into expanding the plan for the processing and freezing of chip steaks.

Barton, Vt.—The Crystal Lake Ice Company here which was owned and operated by Paul Heidger for the past several years, has been purchased by Sylva Lussier who plans to carry on the business much as his predecessors have done.

Fires and Accidents

England, Ark.—Fire of undetermined origin caused about $25,000 damage to the England Ice Company plant. Considerable damage was done to heavy machinery. Loss was covered by insurance.

Rogers, Ark.—Sparks from welding torches started a fire at the Rogers Ice and Cold Storage company's plant recently resulting in damage totaling about $100.

Washington, N. J.—Fire damaged the office and roof of the Artificial Ice Co. building in Nunn Ave. The blaze was believed to be caused by an overheated stove or defective wiring and the estimated damage amounted to from $300 to $500.

Birmingham, Ohio—The Henrietta Packing Co., slaughterhouse and sausage plant owned by Mike Polansky was completely destroyed by fire. Loss, partially covered by insurance, was estimated at $25,000. Polansky is continuing to operate his retail business in a near-by building which was not reached by fire.

La Plata, Argentina, S. A.—A violent explosion, followed by fire, occurred here in the Swift & Company's meat refrigeration plant. First reports said many casualties were feared.

CONVENTION CALENDAR

NORTH CAROLINA ICE ASS'N.
March 12-13, 1951
Hotel Charlotte, Charlotte, N. C.
LEWIS H. POWELL, Secy.-Treas.

VIRGINIA ICE MANUFACTURERS ASSOCIATION
March 21-22, 1951
Hotel Chamberlin, Old Point Comfort, Va.
H. H. SNYDER, Secretary-treasurer

NORTHWEST ASSOCIATION OF ICE INDUSTRIES
March 29-30, 1951
Vancouver, Canada
L. F. MARSH, Exec. Secy.

EASTERN STATES ICE ASSOCIATION
April 3, 1951
Warwick Hotel, Philadelphia, Pa.
SAMUEL FREER, Secy.-treas.

NEW ENGLAND ICE ASSOCIATION
April 11-12, 1951
Sheraton-Biltmore Hotel, Providence, R. I.
RAY T. WILBER, Exec. Secy.

ASSOCIATION DIRECTORY

AMERICAN INSTITUTE OF REFRIGERATION
H. T. McDermott, Gen. Secretary, 433 N. Waller, Chicago 44, Ill.

NATIONAL ASSOCIATION OF ICE INDUSTRIES
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NATIONAL ASSOCIATION OF REFRIGERATED WAREHOUSES
Wm. Dalton, Exec. Vice-Pres. Tower Bldg., Washington 5, D. C.

NATIONAL ASSOCIATION OF PRACTICAL REFRIGERATING ENGINEERS
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317 Eglinton Ave., Toronto, Canada

DELTA STATES ICE ASSOCIATION
R. N. Milling, Secretary
Ouachita Bank Bldg., Monroe, La.

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Board of Trade Bldg., Indianapolis, Ind

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Manhattan Ice & Cold Storage Co., Manhattan, Kans.

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429 S. Seventh St., Louisville, Ky.

MICHIGAN ICE INDUSTRIES ASSOCIATION
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131 E. Kalamazoo Ave., Kalamazoo, Mich.

MISSOURI VALLEY ICE MANUFACTURERS' ASSN.
V. A. Esphorst, Secretary
3820 Washington St., St. Louis, Mo.

MOUNTAIN STATES ASS'N OF ICE INDUSTRIES
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Espy Ice Co., 2229 - 15th St., Denver, Colo.

NEBRASKA ASSOCIATION OF ICE INDUSTRIES
Frank Vogelsang, Secretary
W. T. Good Ice Co., Lincoln, Nebr.

NEW ENGLAND ICE ASSOCIATION
Raymond Wilber, Secretary
83 Winter St., Providence, R. I.

NEW YORK STATE ASS'N REF. WAREHOUSES
Chas. G. Ashe, Secretary
101 Columbia St., Buffalo 5, N. Y.

NORTH CAROLINA ICE ASSOCIATION
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Capital Ice & Coal Co., Raleigh, N. C.

NORTHWEST ASSOCIATION OF ICE INDUSTRIES
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1539 N. E. 37th Ave., Portland, Ore.

OHIO ASSOCIATION OF ICE INDUSTRIES
Guy W. Jacobs, Secretary
The Steubenville Ice Co., Steubenville, O.

OKLAHOMA ASSOCIATION OF ICE INDUSTRIES
Harry T. Hudson, Executive Secretary
708-9 Perrine Building, Oklahoma City, Okla.

PACIFIC STATES COLD STORAGE WAREHOUSEMEN'S ASSOCIATION
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461 Market St., San Francisco, Calif.

SOUTH CAROLINA ICE MANUFACTURERS ASS'N
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P. O. Box 603, Columbia, S. C.

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SOUTHWESTERN ICE MANUFACTURERS ASS'N
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Mercantile Bank Bldg., Dallas, Tex.

TENNESSEE ICE MANUFACTURERS ASSOCIATION
W. E. Harlan, Secretary
Mt. Pleasant Ice Co., Mt. Pleasant, Tenn.

TRI-STATE ASSOCIATION OF ICE INDUSTRIES
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260 Boyce-Greeley Bldg., Sioux Falls, S.D.

VIRGINIA ICE MANUFACTURERS ASSOCIATION
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Alexandria, Va.

WEST VIRGINIA ASSOCIATION OF ICE INDUSTRIES
E. Dana Smith, Secretary
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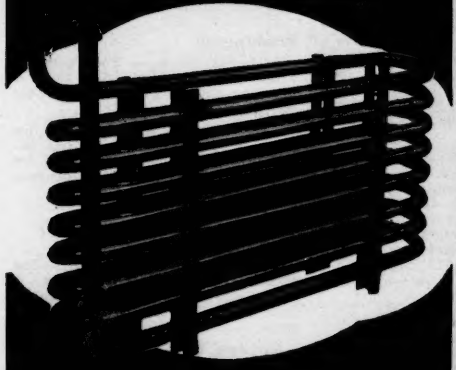

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Dependable **S&S** *Automatic*

ICE VENDING STATIONS

Since 1930 progressive ice distributors throughout the nation have installed completely automatic S&S refrigerated ice vending stations to step up profits. They have found that automatic stations cut distribution costs . . . hold old customers . . . and develop new money-making consumers. Many have used S&S automatic stations to replace unprofitable routes.

Now **F.O.B.** Hagerstown, Maryland
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S&S automatic Ice Vending Stations are completely assembled and ready to plug in on arrival. Each has its own refrigeration system.

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702 North Sixth St. — Vincennes, Indiana
1011 No. Highland St. — Arlington, Virginia

NEW PLANTS and IMPROVEMENTS

This Department each month presents the more important developments covering new constructions, as well as additions, improvements, remodeling, and installations of new equipment in ice and cold storage plants and other industrial plants that use refrigeration. News notes on all such new constructions and improvements are invited.

Arizona

Wickenburg, Ariz.—The Wickenburg Ice Company recently installed another S & S ice vending machine.

California

Los Angeles, Calif.—Blythe Bell of this city has just installed a new S & S ice vending station to serve the Huntington Park area.

Florida

Dover, Fla.—Southland Frozen Foods, already making a considerable contribution to the agricultural economy of East Hillsborough County with its modern plant at Plant City, is expanding its operation by completing a new strawberring processing plant adjacent to the Gallagher and Walden vegetable packing house.

Plymouth, Fla.—To overcome warehousing problems, the Minute Maid Corporation has entered into a contract with the Central Florida Refrigerated Warehouse Corp. under which that company is constructing, adjacent to the Minute Maid plant here, a 2,500,000 cubic foot low temperature warehouse.

Illinois

Pinckneyville, Ill.—The Pinckneyville Ice Plant recently installed a new 210-ton tank. The new tank will increase the daily out-put seven tons, giving each twenty-four hour shift a total ice tonnage of about 43 tons.

Indiana

Logansport, Ind.—Construction of a new $337,000 refrigeration and storage building at the Logansport State hospital is being contemplated and contracts will be awarded soon.

Princeton, Ind.—The Henneberger Ice & Storage Co. has installed a modern 24-hour automatic ice vending station.

Louisiana

Sterlington, La.—Sterlington Ice Company has been granted tax exemption on new construction valued at $17,081.

Maryland

Baltimore, Md.—Consolidated Grocers Corp., C. D. Kenny Division, reports that construction is under way on a wholesale grocery warehouse with 75,000 cubic feet freezer space, 15,000 cubic feet cooler space, and dry storage space covering 100,000 square feet.

Michigan

St. Joseph, Mich.—The Sodus Fruit Exchange is considering another huge addition to its cold storage facilities. A 90 x 130 foot cold storage addition, which would have a holding capacity of 4,000,000 pounds of frozen foods and 50,000 bushels of fresh fruits is contemplated.

Flint, Mich. — Construction that will double the storage facilities of Flint Cold Storage Co., 925 S. Dort Highway, has started. Joseph C. Catizone, owner and manager, said the addition will cost more than $20,000. Surplus foods distributed to schools in eight counties are stored in the refrigerated plant and it also has been approved as storing place for perishable foods purchased for the Fifth Army.

Missouri

St. Louis, Mo.—The Ball Ice Machine Company, in preparation for the coming season, is now installing another S & S ice vending machine for the automatic sale of processed ice.

Springfield, Mo.—The Springfield Ice & Refrigeration Co. will build a 400,000 cubic foot capacity building here as an expansion of its present building, according to Dan Diesel, vice president and general manager. The company is a subsidiary of the City Products Corp. of Chicago.

Nevada

Reno, Nev.—Crystal Springs Ice Co. has established three new ice vending units. The S & S Vending Machine Company of California supplied the equipment.

New Jersey

Perth Amboy, N. J.—A new addition which will expand production facilities 50 percent is being constructed at Barbys Frosted Foods here. The 3,500 extra square feet of space will accommodate a large cooler, a quick freezer, and holding rooms. The poultry packing firm is extending distribution to New England, S. B. Kagan, president, said.

Oklahoma

Stilwell, Okla.—The Stilwell Canning Company is building a quick freeze plant which will have a capacity of 150,000 pounds of strawberries daily. The Reconstruction Finance Corp. has made a $60,000 loan to the company to help in its construction. Claude Todd, Joe Mitchell, Perry Etheredge, Roy Reese and C. J. Carson are owners and promoters of the industry.

Oregon

Forest Grove, Ore.—Work has started on a $100,000 zero room to be added to the Hudson House plant here. The 80x200 foot structure to be built east of the present plant will almost double the capacity for holding fruits and vegetables.

South Carolina

Charleston, S. C.—The Purity Ice Cream Company recently completed its new plant on Rivers Avenue near North station. W. Carl Wiggins, president, said the plant is the largest of its kind in South Carolina.

Utah

Ogden City, Utah—The Western Gateway Storage Company's new $400,000 plant at 130 West Twenty-eighth has just been completed. The structure contains approximately 60,000 square feet and has 12,000 square feet of refrigerated space. The plant will care for freezer, cooler and general commercial type dry storage.

Washington

Peshastin, Wash. — The Peshastin Fruit Growers Association here is planning the construction of a cold storage plant.

Seattle, Wash.—E. J. Lawrence Ice Delivery Service Company has installed a new model 16 S & S ice vending station equipped to dispense block and processed ice.

Icy Item

South San Francisco, Calif.—The South San Francisco Cold Storage & Warehouse Co. seeks permission to issue and sell 1000 shares of capital stock.

San Jose, Calif.—The San Jose Ice Company seeks dissolution of its incorporation.

Ossining, N. Y.—Articles were filed with the office of the Secretary of State, Albany, for Ossining Hygeia Ice Co. Inc., changing the capital stock from 1,400 shares, 400 preferred $100, 1,000 common no par value to 1,278 shares, 278 preferred $100, 1,000 common no par value.

New Incorporations

Buffalo, N. Y.—The Hertel Ice Co., has been established at 1950 Delaware Ave., by Howard W. Jackett.

New York, N. Y.—Articles of incorporation were filed with the office of the Secretary of State, Albany, for R. L. S. Cold Storage Co. Inc., to operate refrigeration plants, cold storage business, etc. Capital stock was listed at 200 shares no par value. Directors: Herbert L. Barrows, Moses T. Barrows and Williams Lindenbaum, 505 5th Ave., New York City.

REFRIGERATION THEORY and APPLICATIONS

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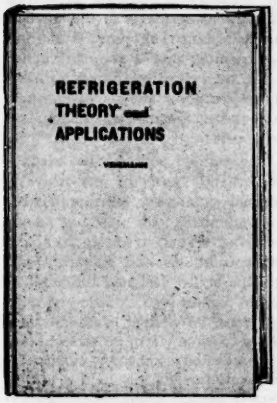

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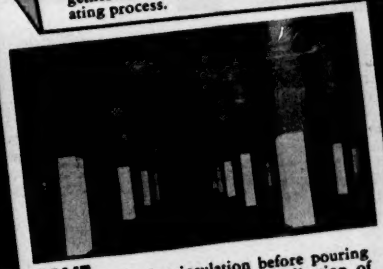

SAVE by laying insulation before pouring concrete—eliminates costly application of insulation after floor has been poured. SAVES TIME TOO.

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DEATHS

John Wesley Howell

THE death of John W. Howell, past president of the American Warehousemen's Association and vice president and director of the Haslett Warehouse Co., San Francisco, Calif., occurred January 26 after an illness of some months.

Mr. Howell was 61 years old and a native of Bisbee, Ariz. Most of his life was lived in California. He graduated from Stanford University with a degree of law in 1912. He practiced law in Los Angeles for several years, and joined the Haslett Warehouse Company in 1919.

John W. Howell

In addition to his business interests mentioned above, he was president and director of the Warehouse Investment Company, vice president and director of the Haslett Compress Company. He was a past president and director of the San Francisco Chamber of Commerce, past president and director of the California Warehousemen's Association, had been a member of the San Francisco Police Commission and was its president during Mayor Lapham's term of office. He was active in the Northern California Distributor's Association from its inception and played a large part in labor negotiation over the years. Besides serving as president of the American Warehousemen's Association, he had been an active member of that association for many years and had served on many committees.

He leaves his widow, a daughter, Mrs. W. B. Dey, and a son, J. W. Howell, Jr.

DUDLEY B. STANSELL of Huntingdon, Tenn., assistant manager of the Huntingdon Ice Co. until he retired in 1948, died January 22 following an operation two weeks previously. He was 68 years old.

HERMAN P. RIEDEL, vice-president of the Hannibal Ice & Cold Storage Co., Hannibal, Mo., died January 28 after a long illness. He is survived by his widow and two children.

Paul P. Harris

THE death of Paul P. Harris, owner of the Harris Ice & Fuel Co., Laurinburg, S. C., occurred at his home in Laurinburg January 30. Mr. Harris was also distributor for the Atlantic Refining Co. He was 43 years old.

Mr. Harris was a life-long member of the First Methodist Church and charter member and past president of Laurinburg Lions Club, county commissioner, veteran of World War II, vice-president and director of the North Carolina Ice Association, director of North Carolina Retail Coal Association, director and past vice-president of the Laurinburg Merchants Association and Chamber of Commerce.

He is survived by his widow, the former Eltia Cashwell of Maxton; and two children, Paul P. Jr. and Jimmy Harris.

HERBERT G. RUMMEL, vice president and treasurer of the Milwaukee Cold Storage Co., Milwaukee, died of a heart attack February 6 at his home. He was 60 years old and had been with the storage company for 40 years. He was a member of the Grace Lutheran Church also a member of the Martin Club and a director and secretary of the Milwaukee Warehousemen's Association.

ADOLPH FEICHERT, formerly operator of the Dallas Ice Factory, Dallas, Tex., in partnership with the late C. L. Wakefield, died December 16, aged 80 years. He retired from business in 1937. Mr. Feichert came to Dallas from St. Louis in 1894 as manager of the Lemp Ice & Cold Storage Co., and later became part owner of the Dallas Ice Factory.

ROBERT W. CLINE, operator of the first retail ice plant in Newton, N. C., died December 23, following a heart attack. He was 76 years old. Mr. Cline formerly was an automobile dealer but had been retired for some years.

Heating and Ventilating Exposition Shows Units

THREE hundred and fifty exhibits were shown at the Tenth International Heating & Ventilating Exposition at Philadelphia, Pa., January 22-26 in connection with the 57th annual meeting of the American Society of Heating & Ventilating Engineers. Noteworthy features of the exposition were large exhibits showing complete units, ready for installation.

Members of the ASHVE, architects, professional engineers and manufacturers from the many industries which depend on heating, ventilating and air conditioning equipment; heating and ventilating contractors and dealers, attended the convention and exposition in large numbers.

An optimistic outlook on sales for the industry is sustained by the orderly growth of demand based on the incidence of new industries, plant expansion required by established industries, continued demand for housing, exhibitors said. An underlying factor that many members of the industry are taking into their calculations seriously is the increasing acceptance of year 'round air conditioning; that is summer cooling in northern climates and winter heating in southern sections, even where extremes of weather are seldom experienced.

Incorporated among the exhibits were many types of air-moving equipment, fans and blowers particularly adapted to the needs of manufacturing plants, warehouses and public buildings and ranging down into the styles designed for application in homes, such as attic and window fans, as well as wall fans, designed to force warm air from heated into unheated rooms. A number of the exhibitors in this field are suppliers to heating equipment manufacturers, while the variety of designs displayed testify to the fact that this is a field for specialization.

One of the features of the exposition was the increase in number and variety of adherents to the cooling phase. Of room coolers there has undoubtedly been an increase that is very marked over the past several years. Such equipment varies greatly in design and in operating characteristics, examples of the most complete designs combining warming of the outdoor air intake electrically in winter, with cooling and dehumidification in summer.

Many cooling units are now combined with heating systems, the so-called winter air conditioners, to form year-round comfort equipment for homes. They may be available in several instances as adjuncts to existing equipment, or as new dual purpose units.

Among supplementary units at the exposition was a self-contained "liquid-cooler" unit, designed to provide cooling for installation in conjunction with hot water, steam or warm air heating equipment, the only extra requirements being simple electric and water connections. Another departure was an internal-combustion-motor driven compressor for air conditioning and refrigeration designed to operate on gas.

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What's New

MACHINERY APPLIANCES • PROCESSES

Electronic Liquid Level Control

AN electronic device used to maintain the liquid level of flooded type refrigeration systems using Freon-12, Freon-22 or Ammonia, has been announced by Sporlan Valve Co., St. Louis. The control is designed to actuate a solenoid valve, magnetic contactor or other equipment requiring the opening and closing of an electrical circuit to maintain constant liquid levels.

The "Select-A-Level" consists of three major parts, the control unit, sensing element and coaxial cable which connects the sensing element to the control unit. The outstanding advantage attributed to the control is the ease of adjustment of Liquid Level and Differential. By simply setting two dials, the device will indefinitely maintain the refrigerant level within the differential range and levels established.

The Select-A-Level control has no moving parts in direct contact with the refrigerant. The sensing element is a porcelain coated steel rod mounted in a steel tube which electronically senses any change in its electrical capacity caused by a rise or fall of the liquid refrigerant. Through the functioning of a vacuum tube, a relay in the control unit actuates a solenoid valve or other equipment requiring the closing and opening of an electrical circuit.

The sensing element can be installed directly in a refrigerant evaporator-accumulator or pressure vessel, or it may be used in any liquid column where present practice utilizes a mechanical float unit. Liquid levels can be maintained anywhere between 0 and 30 in. depending upon length of sensing element used.

The component parts of the main control unit including the vacuum tube, relay unit and electronic unit are replaceable. Electrical current requirements are 115 volts 60 cycles alternating current. Not available for direct current supply. Control unit 6x9½x3½ in.

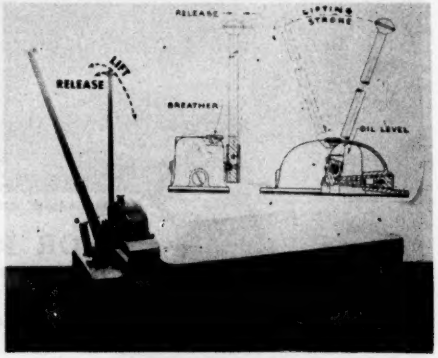
New Load-Lift Features Labor Saving Pump

DESIGNED and engineered to cut working time, the new aluminum single-unit oil tank and pump combination is claimed to enable the new Marforge Lightning Load-Lift to raise loads easier and faster. Borg-Warner and Market Forge engineers cooperated in the development of this pump. The hydraulic fluid is contained in the unit above the dual pumps. This allows the fluid to circulate by gravity, rather than being sucked up into the pump from a separate tank underneath.

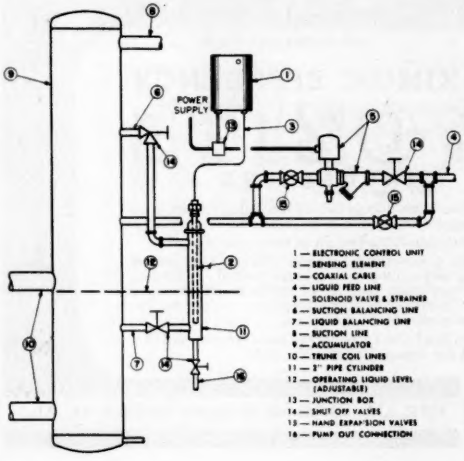
Another new design enables the truck to be lowered by a simple right-angle flick of the handle. This innovation completely eliminates stooping or bending to lower the loads. The truck raises and lowers with the same lifting handle while the operator stands. He does not need to bend at any time. This new one-unit pump also eliminates the need for gaskets, dust boot and needle-type valve. It fits interchangeably into all standard Load-Lifts and may be purchased as a separate unit.

The New 1951 Lightning Load-Lift is equipped with this heavy-duty, labor-saving pump as well as with self-sealed ball-bearings, greased for life, and set in steel, cushion rubber, or plastic wheels to assure easier, faster rolling over uneven floors and obstructions. A double ball-bearing fifth wheel allows the Load-Lift to steer easily with any handle position, and to get into narrow aisles. The lifting and lowering mechanism is completely separate from the pulling handle. Modern arc-welded frame construction with smooth, rounded corner and edges gives streamlined simplicity and safety. All Marforge Load-Lifts are guaranteed for 20 percent overloads.

Market Forge will continue to manufacture their "standard" model which is somewhat lower in price.

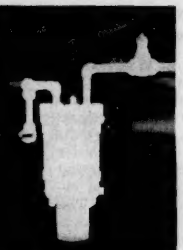


New Market Forge Load Lift


POWER SUPPLY
1 — ELECTRONIC CONTROL UNIT
3 — SENSING ELEMENT
3 — COAXIAL CABLE
4 — LIQUID FEED LINE
5 — SOLENOID VALVE & STRAINER
6 — SUCTION BALANCING LINE
7 — LIQUID BALANCING LINE
8 — SUCTION LINE
9 — ACCUMULATOR
10 — TRUNK COIL LINES
11 — 2" PIPE CYLINDER
12 — OPERATING LIQUID LEVEL (ADJUSTABLE)
13 — JUNCTION BOX
14 — SHUT OFF VALVES
15 — HAND EXPANSION VALVES
16 — PUMP OUT CONNECTION

Side sketch illustrates the use of the liquid level control on an ice tank or brine cooler accumulator. The sensing element of the control is installed in a liquid leg.

ARMSTRONG PURGERS SAVE 4 WAYS



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CHECK your system for excess head pressure . . . Each 4 lbs. excess raises the load on your compressor, reduces its capacity by 1% and increases power costs 2%! Air and other non-condensables collecting in the condenser and receiver are nearly always the cause. An Armstrong Purger rids the system of air and keeps it that way...reduces loss of refrigerant...saves labor and time. The Purger pays for itself in short order.

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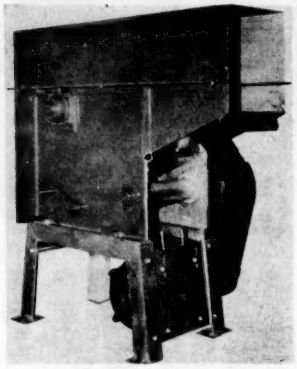
Lilly Announces Complete Line of Ice Breakers

A COMPLETE new line of ice breakers is now announced by the Lilly Company, manufacturers of ice sizing and breaking equipment. The new models range from 10 to 35 tons per hour capacity and the largest model will handle a full 300 pound cake of ice. In developing these new models, the manufacturer has retained such basic principles as the low angle hopper feed, the breaker plate adjustment and general ruggedness of the frame. To these principles have been added new features that have been developed in answer to needs of the industry.



The Lilly Ice Breaker with front plate removed to show construction.

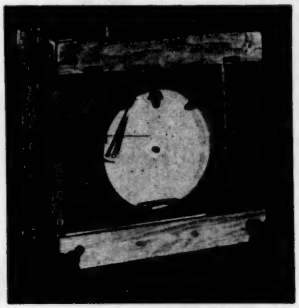
By increasing the diameter of the pick drum and adding more weight, it has been possible to slow up the Breaker over 50 percent to 80 rpm. and still produce the rated capacity of the unit. This feature is an important factor the manufacturer states because it is an accepted fact in the industry that the slower the Breaker revolves, the less fine ice produced.

The new breakers require a minimum of floor space. The motor is mounted under the breaker in a protected position and all drives are completely guarded for safety. Also, the top of the breaker hopper can be easily removed for replacing, tightening or sharpening teeth.

Another new feature is the option of a stainless steel hopper at only slight additional cost. In some parts of the country, rust, generally caused by salt air or high humidity conditions, has been a serious problem. The stainless steel hopper will greatly alleviate and in many instances completely solve this problem. Ice is definitely a food product and should be handled as such. Complete information on the equipment is available from The Lilly Co., Memphis 1, Tenn.

Vibration Resistant Temperature Recorder

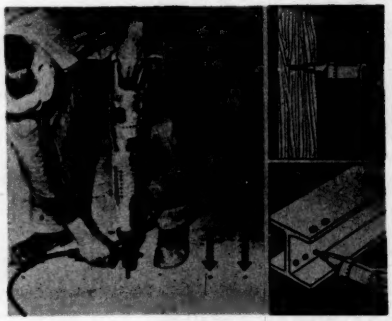
OF SPECIAL interest to the transportation industry is the development of a temperature recorder which will take and record cargo and vehicle temperatures during transit across the country. This recorder uses a counter balanced recording pen and is mounted on a special vibration resistant suspension. The manufacturers state that the new equipment gives better and more accurate record of temperature in moving vehicles.



Temperature Recorder

Hunter Mfg. Co., Cleveland, Ohio, who make gasoline heaters and dry ice refrigeration equipment are utilizing this new recorder as a feature of a new consulting and advisory service now available to fleet owners, shippers, carriers and vehicle builders.

Every phase of temperature control for transport vehicles is embraced in this new service. It covers such factors as various methods of checking and testing the efficiency of heating and refrigeration systems under actual operating conditions, as well as loading methods, insulation, weatherproofing and the arrangement of ducts, wall battens and floor liners to achieve maximum heating or refrigeration efficiency.



New Wodack "Do-All" electric drill being used to drill concrete, wood and metal.

Rubber Company Produces New Belt With Teeth

SHOWN at the right is a close-up of the new belt with teeth which United States Rubber Company, its developers, considers to be the most outstanding advancement in power transmission during the past 50 years. Note that belt has positive engagement with pulley. The belt will not slip, permits split-second timing, will attain speeds up to 16,000 feet per minute and operates more quietly than precision gears running in an oil bath. Pulleys can be produced by die casting, sintered metal, pressed metal or machined.

Portable Tool for Drilling

A COMBINATION portable electric hammer and sturdy drill called the Wodack "Do-All" has been announced by the Wodack Electric Tool Corp., Chicago. This drill utilizes its one motor for performing three different types of work (1) drilling concrete and masonry, (2) drilling metal and wood, and (3) driving, grinding, buffing and wire wheels. It is fully equipped with ball-bearings with sealed lubrication, and is built throughout to stand up under hard, continuous usage. It is easy to maintain. The hammer member may be taken apart for cleaning and greasing, and the switch and carbon brushes can be replaced quickly. It is operated by a universal motor with fan ventilation, with switch conveniently located in the handle. Additional information may be secured by writing manufacturer direct.

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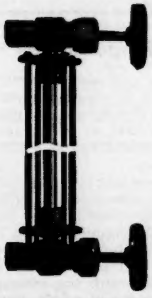

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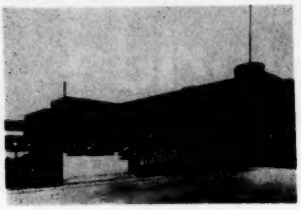
New Meat Plant Installs Howe Polar Circle Coils

DESCRIBED as one of the most modern of its kind in the southwest, the meat packing plant just erected by Neuhoff Brothers, Packers, in Dallas, Texas, is equipped with new Howe Polar Circle Coils. These



Front view of new meat packing plant erected by Neuhoff Brothers, Dallas, Texas.

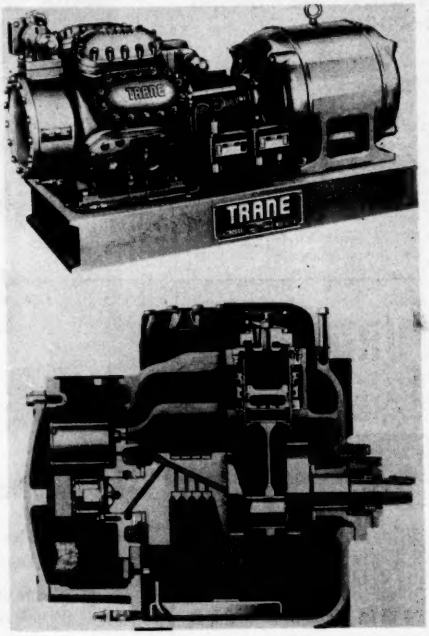
Howe Polar Circle Coils, developed out of the company's 39 years experience in the refrigeration field, are built for heavy duty use in both coolers and freezers.

Interior of new Neuhoff meat packing plant showing circle coils.

According to the maker, they represent a revolutionary step forward in refrigeration efficiency and economy. They are designed and constructed to maintain ideal temperature, humidity and air circulation control, and Neuhoff Brothers have installed them in their sausage cooler, pork cutting cooler, order assembly cooler, bacon slicing cooler and lard cooler. This streamlined new plant was designed by Henschien, Evards & Crombie, Chicago.

Trane Reciprocating Compressor a Compact Unit

THIS eight cylinder reciprocating compressor unit, built by The Trane Company, La Crosse, Wisconsin, is said to combine low operating and maintenance costs with quiet, vibrationless operation. Made in six sizes, from 10 to 50 tons refrigeration capacity, in four, six and eight cylinder models, the compressors are designed specially for comfort and process air conditioning applications with variable cooling demand. Units have "unloaded" starting and automatic internal capacity control, governed by cooling demand.



Cutaway drawing shows internal design of Trane reciprocating compressor. Oil passages within crankshaft are designed to carry foreign matter away from bearing surfaces by centrifugal force. Pistons and connecting rods are made of aluminum to reduce reciprocating weight. Crankshaft is dynamically and statically balanced to reduce vibration, noise and wear.

Additional information concerning this compressor unit may be had by contacting the manufacturer mentioned above.

Two views of Trane reciprocating compressor unit. Cutaway drawing below shows internal design.

MANUFACTURERS' NEWS

Johns-Manville Regroups Executive Responsibility

THREE new directors have been elected and a new vice chairman and a new president have been appointed in a regrouping of executive responsibilities in Johns-Manville Corporation "to assure continuation of a strong company position in the difficult times ahead." The announcement is made by Lewis H. Brown, Chairman who continues as chief executive officer, a post he has held since 1929. During the past ten years Johns-Manville net sales have increased from about $60,000,000 to a record year of more than $200,000,000 in 1950.

Clifford F. Rassweiler has been appointed vice chairman of the board, a newly created office. He has been delegated full responsibility for organization and direction of the newly established Planning Board, and will serve as assistant and alternate to the chairman. He will also continue his responsibilities as vice-president for Research and Development, a post he has held since 1942, as well as assuming new responsibilities as a director of the company.

The new president is L. M. Cassidy, who has been vice-president of Sales since 1946. Mr. Cassidy, who joined Johns-Manville organization in 1926, succeeds R. W. Lea who retired as president and director on January 31, 1951, in accord with the company's regular retirement plan. Mr. Cassidy also becomes a director of the corporation.

A. R. Fisher, vice president for Production and general manager of the company's Asbestos Fibre Division, has been elected a director.

J. A. O'Brien, general manager of the Industrial Products Division is one of the three new vice presidents. Mr.

DIMCO CAST ALUMINUM FIN EVAPORATING COIL

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★ *Saves Weight*

★ *Saves Cost*

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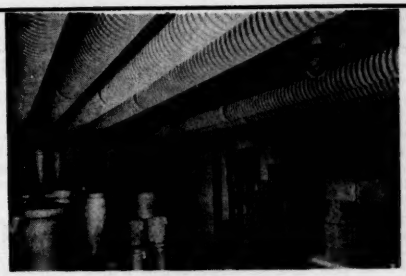

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Minus 15° F.

LITTLE GIANT ICE BREAKERS
TRUCK MODEL—GAS ENGINE DRIVEN

Model WP-92

INCREASE YOUR PROFITS BY DELIVERING FRESHLY BROKEN ICE IN SIZES FOR ALL NEEDS RIGHT AT THE DOOR

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- Easy Starting Briggs & Stratton Engine.

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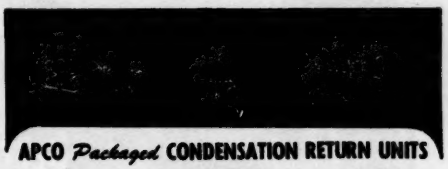

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10 to 40 lbs. with 8, 15, 30 Gallon Receivers

Packaged Duplex Condensation Return Unit with No. 4 Series Apco Pumps.

Start saving valuable heat units with APCO Square Tank Units. Built to meet demand for a smaller unit with the superb performance of our larger units. Remember, the Pumps are Apcos. No Vapor Binding — Special Provision for Expansion and Contraction — No Frictional Wear within pump. Thus, ECONOMY.

Write for Bulletin 113-ST

DISTRIBUTORS IN PRINCIPAL CITIES

Aurora Always Pumps — **AURORA PUMP COMPANY**

78 Loucks St., Aurora, Illinois

Steam Baked

Reliable TRADE MARK **Corkboard**

- 30 years serving the Refrigeration, Cold Storage, Meat Packing Industries, and Ice Plants.
- Prompt shipments anywhere.
- Your inquires invited!

LUSE-STEVENSON CO., INC.

879 Blackhawk Street
CHICAGO 22, ILLINOIS

DISTRIBUTORS WANTED

O'Brien joined Johns-Manville in 1915 in the company's sales promotion department. He later became a salesman, advancing to assistant manager of the oil industry department, Eastern Division Manager of the industrial department, and sales manager of the power products and industrial department. He was made general manager of the Industrial Products Division in 1946.

The other vice presidents of the parent corporation appointed were Harold R. Berlin, general manager of the J-M Building Products Division, and A. S. Elsenbast, general manager of the J-M Celite Division.

Reidel Named Chief Engineer U. S. Air Conditioning Corp.

FREDERICK G. Riedel has been appointed chief engineer of the United States Air Conditioning Corporation, Minneapolis, and will be in charge of design, development and research activities.

Mr. Riedel was formerly chief engineer and works director of research at the Holyoke Works of the Worthington Pump & Machinery Corp. He has also been associated with the Houde Engineering Corporation of Buffalo, N. Y., and with the Carrier Corporation in Newark, N. J., as research engineer. For the past two years, he has been engaged in design and development work on a new beverage cooler.

Educated in Germany, Mr. Riedel is a member of the National Professional Engineering Society, a registered professional engineer in Massachusetts, and has been a member of ASRE since 1937.

Wright Appoints McCumber District Sales Manager

THE appointment of Charles W. McCumber as St. Louis District Manager is announced by Wright Chemical Corp., Chicago. With headquarters in St. Louis, he will be in

Charles W. McCumber

charge of all Wright water-conditioning sales representatives in Missouri, Arkansas, Tennessee, Kansas and the southern half of Illinois. Mr. McCumber, a registered professional engineer in Illinois and a member of the National Association of Power Engineers, was mid-west regional manager of Feedwaters, Inc., for fifteen years.

Niagara Blower Licensed to Make Water Defrost Coils

ANOTHER important firm in the commercial refrigeration industry has been granted license to manufacture Water Defrost Coils, according to an announcement made by Hy Jarvis, vice-president and general manager of Refrigeration Engineering, Inc. holders of the patent covering the water defrost principle. The Niagara Blower Company, 405 Lexington Avenue, New York, is the seventeenth firm to be issued such a license by Recold.

Developed in 1938, a patent covering the water defrost principle was granted to Refrigeration Engineering in 1940. This method of defrosting low temperature coils is now widely used. By means of using the city water supply, the coil may be defrosted in less than five minutes without any product warmup. The coils are designed for both manual or automatic defrosting.

Easier and Cheaper with

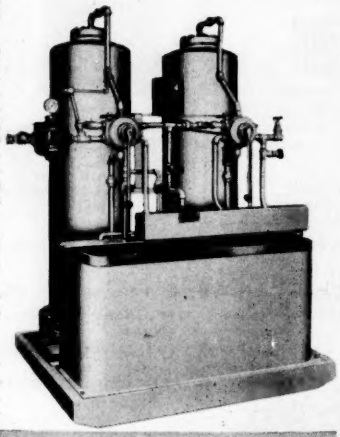
INDUSTRIAL Water Demineralizer

It's worth looking into . . .

The demineralization of water is not something new. It is used in the food industry, in the chemical and other industrial processing where chemically pure water is used in quantity. The very low cost warrants your looking into it.

Here are some of the advantages you get with an INDUSTRIAL demineralizer in ice making. Since the dissolved mineral salts in ordinary water are removed in passing through the ion-exchange resins, core-water removal and replacement is unnecessary. Losses due to cracking are greatly reduced. Freezing at the lower brine temperature increases daily yield. And the bulk of the cake of ice is clearer—your customers will notice that.

If you will send us an analysis of the water you are using, the quantity you need, and at what rate (gallons per hour) we will send you information on INDUSTRIAL demineralizers, estimate of costs, performance data, etc. Better do it now.



A typical two-bed INDUSTRIAL Water Demineralizer. Standard models available with capacities up to 1000 gph. Special units of any capacity engineered to requirements.

FILTERS Pressure Type · PUMPS Centrifugal · CORROSION TESTING APPARATUS Salt Fog • Humidity

INDUSTRIAL FILTER & PUMP MFG. CO.

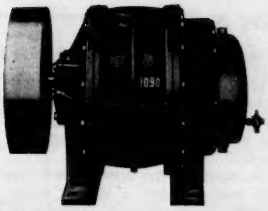
5914 Ogden Avenue
Chicago 50, Illinois

RUBBER DIVISION Vulcanized Linings • Molded Products · WATER DEMINERALIZERS

BE SURE TO GET V-P-L

When you buy equipment for new plants, expansion or replacements, specify R-C Rotary Positive Blowers. You can always depend upon them to deliver positive Volume at required Pressures and at Low power cost. No matter what the outside temperature, you get essential V-P-L with R-C Blowers. Write for details in free Bulletin R-C 1247.

Roots-Connersville Blower Corporation
510 Columbia Avenue, Connersville, Indiana



ROOTS-CONNERSVILLE

ONE OF THE DRESSER INDUSTRIES

CEMCO

Double Gig Ice Hoist
Fast - Sturdy - Dependable -

Send for details

THE CAPITAL ELEVATOR & MFG. CO.
424 W. Town St.
Columbus 8, Ohio

CONSIDER DURABILITY

The installation of a Layne Well Water System is your guarantee of an abundant water supply with the lowest possible operating cost. The extra durability built into all Layne equipment assures you of dependable performance with little attention and practically no upkeep. For further information, catalogs, etc. address

LAYNE & BOWLER, INC.
General Offices, Memphis 8, Tenn.

Layne

WELL WATER SYSTEMS
VERTICAL TURBINE PUMPS

THE INDEX LINE
ICE DEALERS SUPPLIES

Only the Highest Quality Merchandise and efficient service necessary for the proper and profitable operation of your business. Write for our 1951 catalog.

INDEX COUPON AND SUPPLY COMPANY
LA PORTE, INDIANA

QUALITY COILS FOR *ALL* APPLICATIONS

WELDED HEADERS, PIPE BENDS AND AMMONIA RECEIVERS

Whether your next job be for a single bend, or coil or complete piping system, Chicago Nipple can supply your requirements. Experienced workmen, practical engineers, and modern equipment reflect the quality of our products.

Coils are of selected ammonia pipe—all joints are electrically welded—checked under water with an air pressure of 300 pounds to guarantee tightness.

SEND DRAWING OR BLUE PRINT FOR QUOTATION

CHICAGO NIPPLE MFG. CO.
1997 Clybourn Ave., Chicago 14, Ill

Byers Appointments

THE appointment of A. B. Drastrup as assistant to the president of A. M. Byers Company, Pittsburgh, has been announced by L. F. Rains, Byers president. He will also continue as Manager of Steel Sales.

Buckley M. Byers, formerly assistant manager of the firm's New York office and manager of export sales, has been named assistant manager of steel sales. He will have his offices in Pittsburgh.

Victor C. Lawrence succeeds Mr. Byers as manager of export sales. Export offices are located at 30 Rockefeller Plaza, New York City.

Owens Elected President Roots-Connersville Blower

ROBERT H. OWENS has been elected president and general manager of Roots-Connersville Blower Corp., succeeding John Avery who died unexpectedly on January 13.

Mr. Owens, a graduate of Purdue University, came to Connersville in 1925 to join the engineering staff of the P. H. & F. M. Roots Co., a predecessor of Roots-Connersville. Prior to joining Roots, Mr. Owens had a variety of industrial experience. He was actively connected with the development of the centrifugal line of blowers built by R-C, and has had many years of experience in building blowers.

In May of 1946, Mr. Owens was named vice-president in charge of engineering and manufacturing, and in July of 1948 he was elected to the board of directors of Roots-Connersville Blower Corp.

Ralph R. Newquist, who became vice-president in charge of sales for Roots-Connersville in May of 1946, has been elected executive vice-president. Mr. Newquist is a graduate of Penn State College. Before joining Roots-Connersville, he was manager of the Washington sales office for the Allis-Chalmers Manufacturing Co.

Less Labor COSTS—Better Insulation SEAL

The MODERN way—spraying asphalt adhesive COLD—gives the contractor a lower labor cost—and the customer a complete, uniform vapor-sealing of his insulation which means less operating cost.

Laykold Applied COLD

INSULATION ADHESIVE

Spray Laykold Adhesive on the wall—let set—apply vapor-seal membrane. Spray the overlaps—TIGHT ADHESION. Spray over the membrane, spray the insulation blocks and install—much easier, FASTER. No fire hazard—no fumes—adheres to damp or dry surfaces—self heals nails, skewers, cracks, etc.—stays ALIVE.

Other LAYKOLD Products

WEATHERCOAT — protection for block insulations, concrete, brick.

HYDROPEL—an admix to reduce water absorption in concrete.

FLOOR MASTIC BINDER — to make ideal floors for cold rooms.

FIBRECOAT—protection for metal and bituminous roofs.

REFRIGERATION BINDER — for waterproof plaster finish and with Lumnite, a wet wall adhesive.

A NEW PRODUCT Laykold Cement

HOLDS CORK *Instantly*

Trowel on cold — place immediately — cork stays put. After curing, cork holds a pull of hundreds of pounds. Holds cork to wood, concrete or cork. Saves **labor** — ideal for new jobs and for insulation patching.

Try Laykold Products on ONE job.

Ask our nearest office for literature, specifications, prices.

IN THE EAST — **AMERICAN BITUMULS COMPANY**
200 BUSH STREET • SAN FRANCISCO 4, CALIF.
Washington 6, D. C. • Baltimore 3, Md. • Perth Amboy, N. J. • E. Providence 14, R. I.
Columbus 15, Ohio • St. Louis 17, Mo. • Baton Rouge 2, La. • Mobile, Ala. • San Juan 23, P. R.

IN THE WEST — **STANCAL ASPHALT & BITUMULS COMPANY**
200 BUSH STREET • SAN FRANCISCO 4, CALIF.
Los Angeles, Calif. • Oakland 1, Calif. • Portland 4, Ore. • Seattle, Wash. • Tucson, Ariz.

CATALOGS AND BULLETINS

Caterpillar Tractor Issues Safety Booklet

A SAFETY booklet designed to focus public attention on the need for better roads has been published by Caterpillar Tractor Co. More than 300,000 copies are being distributed throughout the world in an effort to publicize the theme that better roads mean safer roads.

The booklet is a compilation of advertisements that appeared in Saturday Evening Post, Time, and Newsweek during 1949 and 1950. The title of the booklet is "Stop Murder," taken from the first two words of the lead advertisement which is entitled, "Stop Murder at the Crossroads."

Seven pages in four colors and a cover in black and white make up the booklet. It is being distributed to safety agencies, directors of state highway departments, state governors, advertising agencies, federal government agencies, contractors, banks, and other interested organizations.

Sun Oil Booklet Describes Use of Refrigeration Oils

THE characteristics and recommended applications for various grades of refrigeration oils are detailed in a new 12-page booklet prepared by Sun Oil Company. "Suniso Refrigeration Oils and Their Applications" should be of particular interest to executives, technicians and jobbers responsible for selecting or supplying correct lubricants for refrigeration and air-conditioning systems. Plant and service men, too, will learn how Suniso Oils can help them increase system efficiency and reduce maintenance. A description of the "Floc" Test, an important method of determining an oil's suitability to low-temperature conditions, is included. Copies of the booklet are available free on request to Sun Oil Company, Philadelphia 3, Pa.

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Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

AIR AGITATING SYSTEMS AND FITTINGS
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Martocello & Co., Jos. A., Philadelphia, Pa.

AIR COMPRESSORS
Frick Co., Waynesboro, Pa.

AIR CONDITIONING EQUIPMENT
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Niagara Blower Co., New York, N.Y.

AMMONIA COMPRESSOR VALVES
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Voss, Inc., J. H. H., New York, N.Y.

AMMONIA COMPRESSORS
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Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Reynolds Mfg. Co., Springfield, Mo.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

AMMONIA CONTROL DEVICES
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.

AMMONIA FLOAT VALVES
Armstrong Machine Works, Three Rivers, Mich.
Frick Co., Waynesvoro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

AMMONIA MANUFACTURERS
Armour Ammonia Div., Armour & Co., Chicago, Ill.
Barrett Div., The, Allied Chemical & Dye Corp., New York, N. Y.
Bower Chemical Mfg. Co., Henry, Philadelphia, Pa.
du Pont, Polychemicals Dept., Wilmington, Delaware

AMMONIA MASKS
Acme Protection Equipment Co., Chicago, Ill.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.

AMMONIA PURIFIERS
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
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AMMONIA RECEIVERS
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Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Kehoe Machinery Co., Inc., R. F., Ridgefield Park, N. J.
National Pipe Bending Co., New Haven, Conn.
Rempe Company, Chicago, Ill.
Reynolds Mfg. Co., Springfield, Mo.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

AMMONIA VALVES & FITTINGS
Acme Industries, Inc., Jackson, Mich.
Dersch, Gesswein & Neuert, Inc. Chicago, Ill.
Shank Co., Cyrus, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

ARCHITECTS AND ENGINEERS
Greene, Van R. H., New York, N. Y.
Ophuls & Associates, Fred, New York, N. Y.

ASPHALT PRODUCTS
American Bitumuls Co. San Francisco, Calif.

AUTOMATIC CONTROL DEVICES
Alco Valve Co., St. Louis, Mo.
Armstrong Machine Works, Three Rivers, Mich.
Frick Co., Waynesboro, Pa.
Rex Engineering & Sales Co., Oklahoma City, Okla.
Vilter Mfg. Co., Milwaukee, Wis.

BAGS, ICE
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Index Coupon & Supply Co., La Perte, Ind.
International Paper Co. New York, N. Y.
Union Bag & Paper Corp., New York, N. Y.
United Ice & Oil Supply Co., Boston, Mass.

BAGS, WATERPROOF PAPER
Index Coupon & Supply Co., La Porte, Ind.
International Paper Co. New York, N. Y.
Union Bag & Paper Co., New York, N. Y.

BEER COOLERS
Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

BLOWERS
Frick Co., Waynesboro, Pa.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.
Roots-Connersville Blower Corp., Connersville, Ind.

BOILERS
Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

BOILER TUBES
Byers Co., A. M., Pittsburgh, Pa.

BOOKS—TECHNICAL
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BRINE CIRCULATORS
Creamery Package Mfg. Co., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.
Reynolds Mfg. Co., Springfield, Mo.
Roots-Connersville Blower Corp., Connersville, Ky.

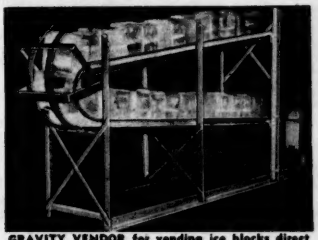
BRINE COOLERS
Acme Industries, Inc., Jackson, Mich.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Reynolds Mfg. Co., Springfield, Mo.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

BRINE SPRAY COOLING
Acme Industries, Inc., Jackson, Mich.
Frick Co., Waynesboro, Pa.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.

(Buyers Directory continued on next page)

ADD CUSTOMERS AND INCREASE PROFITS

NOW you can convert your ice plant sales from attendent service to 24 hour automatic self-service for as little as $420.00. A complete installation of Model 25A (capacity 27—25 lb. blocks) and Model 50B (capacity 19—50 lb. blocks), including your preference of coin operated (with totallizer feature), lever operated, or slide operated coin mechanisms for $840.00 f. o. b. Chicago.



GRAVITY VENDOR for vending ice blocks direct to your customer.

Four types of Frigid-Vend Machines offer a complete line from which to choose the ones best suited to your ice rooms and to your customer's requirements.

Make your selection from these star performers:

★ **GRAVITY FEED**—vends 25 and 50 lb. blocks.

★ **CONTINUOUS METAL BELT**—vends bags and blocks from separate decks.

★ **CHAIN DRIVE**—double-deck for bags or cartons.

★ **FOUR DECKER**—chain drive for combination bag and block delivery.

Write for complete literature on Frigid-Vend vendors

THERMO CUBER

THERMO CUBER CO., INC.

2120 No. Southport Ave. • Chicago 14, Ill.

Frigid-Vend Vendors are available through:

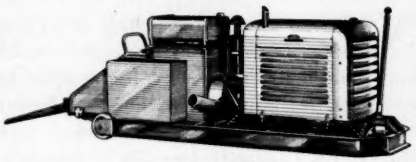
Ice Plant Equipment Co.
2543 Frankford Ave.
Philadelphia, Pa.

Preston-Bugeon Refrigeration Co.
1733 Main Street
Kansas City, Mo.

G. H. Voter Co.
310 Congress Street
Boston, Massachusetts

CRUSHED ICE ANYWHERE

Capacity: 6 whole 300 lb. blocks per minute!



with the NEW

GASOLINE-POWERED

Tri-Pak Ice Crusher-Slinger

Power packed for speed and capacity delivery, Tri-Pak's new gasoline Crusher-Slinger crushes and delivers *1800 pounds of ice every 60 seconds!*

Complete self-contained, this Crusher-Slinger unit can be moved easily and quickly on its rubber-tired ball bearing wheels. A heavy "X" type frame of welded channel steel gives rigid support to the loading ramps, the crusher, the slinger and the Ford Industrial Power Unit.

Variable twin ice feeder chains give positive feed of ice blocks into the crusher. A master clutch permits the engine to idle when not in actual use. Crusher drum and impeller wheel are dynamically and statically balanced for smooth operation.

Write or phone TODAY for complete information about Tri-Pak's gasoline or electric Crusher-Slingers, or Tri-Pak's full line of icing equipment.

TRI-PAK Machinery SERVICE INC.

HARLINGEN, TEXAS

Phone 703

Head Pressure REDUCED by 50 lbs.

REX AIR PURGER

Here's proof of actual results with a Rex Air Purger. When you purge your refrigeration system of non-condensable and permanent gases you reduce head pressure and lower power costs. Investigate today—Write Dept. IR.

REX ENGINEERING & SALES CO.

Oklahoma City, Oklahoma

BOX 5141

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Ohio Galvanizing & Mfg. Co., Niles, Ohio
Reynolds Mfg. Co., Springfield, Mo.
Vogt Machine Co., Henry, Louisville, Ky.

CAR ICING EQUIPMENT
Capital Elevator & Mfg. Co., Columbus, Ohio
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Lilly Co., The, Memphis, Tenn.
Tri-Pak Machinery Service Inc., Harlingen, Texas

COILS
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Chicago Nipple Mfg. Co., Chicago, Ill.
Creamery Package Mfg. Co., Chicago, Ill.
Detroit Ice Machine Co., Detroit, Mich.
Howe Ice Machine Co., Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Rempe Company, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

COLD STORAGE CONSTRUCTION
Armstrong Cork Co., Lancaster, Pa.
Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

COLD STORAGE DOORS
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Refrigeration Engineering Co., Montgomery, Minn.

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CONDENSERS
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King-Zeero Co., Chicago, Ill.
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Philadelphia Pipe Bending Co., Philadelphia, Pa.
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Ophuls & Associates, Fred, New York, N. Y.

CONVEYORS
Capital Elevator & Mfg. Co., Columbus, Ohio
Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.

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Frick Co., Waynesboro, Pa.
Vilter Mfg. Co., Milwaukee, Wis.

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Luse-Stevenson Co., Inc., Chicago, Ill.

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Wright Chemical Control Corp., Chicago, Ill.

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Armstrong Cork Co., Lancaster, Pa.

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DEMINERALIZING EQUIPMENT
Industrial Filter & Pump Mfg. Co. Inc., Chicago, Ill.

DIP TANKS AND CAN BASKETS
Frick Co., Waynesboro, Pa.
Ice Plant Equipment Co., Inc. Philadelphia, Pa.
Knickerbacker Stamping Co., Parkersburg, W. Va.
Martocello & Co., Jos. A., Philadelphia, Pa.
Ohio Galvanizing & Mfg. Co., Niles, Ohio
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Niagara Blower Co., New York, N.Y.

EVAPORATORS
Acme Industries, Inc., Jackson, Mich.
Creamery Package Mfg. Co., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Niagara Blower Co., New York, N.Y.
Rempe Company, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

FEED-WATER HEATERS
National Pipe Bending Co., New Haven, Conn.
Vogt Machine Co., Henry, Louisville, Ky.

FIBERGLAS
Armstrong Cork Co., Lancaster, Pa.

FIELD ICE SAWS
Gifford-Wood Co., Hudson, N. Y.
United Ice & Oil Supply Co., Boston, Mass.

FILTERS, CLARIFYING
Industrial Filter & Pump Mfg. Co., Inc., Chicago, Ill.

FILTERS, WATER
Frick Co., Waynesboro, Pa.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Industrial Filter & Pump Mfg. Co., Inc., Chicago, Ill.
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Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

FOOD FREEZING EQUIPMENT
Howe Ice Machine Co., Chicago, Ill.

FROZEN FOOD LOCKERS
Knickerbocker Stamping Co., Parkersburg, W. Va.

FUEL OIL PRE-HEATERS
National Pipe Bending Co., New Haven, Conn.
Rempe Company, Chicago, Ill.

HAND TRUCKS
Ohio Galvanizing & Mfg. Co., Niles, Ohio

HOISTING APPARATUS
Capital Elevator & Mfg. Co., Columbus, Ohio
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Reynolds Mfg. Co., Springfield, Mo.

HUMIDITY AIR CONDITIONERS
Niagara Blower Co., New York, N.Y.

ICE BAGS
International Paper Co. New York, N. Y.
Union Bag & Paper Corp., New York, N. Y.

ICE BLOWERS
Gifford-Wood Co., Hudson, N. Y.

ICE CANS
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Knickerbocker Stamping Co., Parkersburg, W. Va.
Ohio Galvanizing & Mfg. Co., Niles, Ohio

ICE CAN FILLERS
Frick Co., Waynesboro, Pa.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Knickerbocker Stamping Co., Parkersburg, W. Va.
Martocello & Co., Jos. A., Philadelphia, Pa.
Ohio Galvanizing & Mfg. Co., Niles, Ohio
Vogt Machine Co., Henry, Louisville, Ky.

ICE CHIPPERS
Capital Elevator & Mfg. Co., Columbus, Ohio
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.
Index Coupon & Supply Co., La Porte, Ind.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE CHUTES
Frick Co., Waynesboro, Pa.
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Jamison Cold Storage Door Co., Hagerstown, Md.
Martocello & Co., Jos. A., Philadelphia, Pa.

ICE CONVEYORS
Capital Elevator & Mfg. Co., Columbus, Ohio
Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.
Refrigeration Engineering Co., Montgomery, Minn.
United Ice & Oil Supply Co., Boston, Mass.

ICE CREAM PLANTS
Frick Co., Waynesboro, Pa.

ICE CRUSHERS
Bateman Foundry & Machine Co., Inc., Mineral Wells, Texas
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Index Coupon & Supply Co., La Porte, Ind.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Lilly Co., The, Memphis, Tenn.
Martocello & Co., Jos. A., Philadelphia, Pa.
Micron, Inc., Bettendorf, Iowa
Tri-Pak Machinery Service Inc. Harlingen, Texas
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE CUBE CONTAINERS
Index Coupon & Supply Co., La Porte, Ind.
International Paper Co. New York, N. Y.
Lilly Co., The, Memphis, Tenn.
Union Bag & Paper Co., New York, N. Y.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE CUBERS
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc. Philadelphia, Pa.
Lilly Co., The, Memphis, Tenn.
Martocello & Co., Jos. A., Philadelphia, Pa.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE CUBING MACHINES
Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.
United Ice & Oil Supply Co., Boston, Mass.

ICE DELIVERY BAGS
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Index Coupon & Supply Co., La Porte, Ind.
International Paper Co. New York, N. Y.
Lilly Co., The, Memphis, Tenn.
Martocello & Co., Jos. A., Philadelphia, Pa.
Union Bag & Paper Corp., New York, N. Y.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE ELEVATORS AND CONVEYORS
Capital Elevator & Mfg. Co., The, Columbus, Ohio
Gifford-Wood Co., Hudson, N. Y.

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Gifford-Wood Co., Hudson, N. Y.
United Ice & Oil Supply Co., Boston, Mass.

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Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Detroit Ice Machine Co., Detroit, Mich.
Enterprise Equipment Corp., Yonkers, N. Y.
Frick Company, Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Ice Plant Equipment Co., Inc. Philadelphia, Pa.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Reynolds Mfg. Co., Springfield, Mo.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

(Buyers Directory continued on next page)

FAST, ECONOMICAL CRUSHER SAVES TIME, LABOR COSTS!

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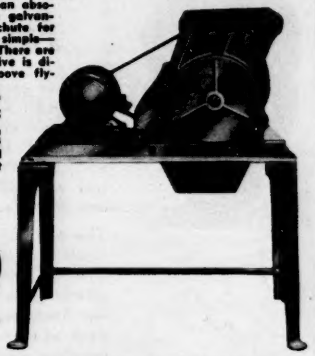

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MINERAL WELLS, TEXAS

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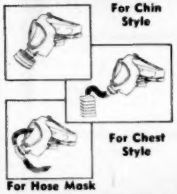

Another exclusive advantage to go with Acme's full vision, dead air check valve, and minimum breathing resistance is the triple utility feature now offered in Acme's new No. 6 face piece.

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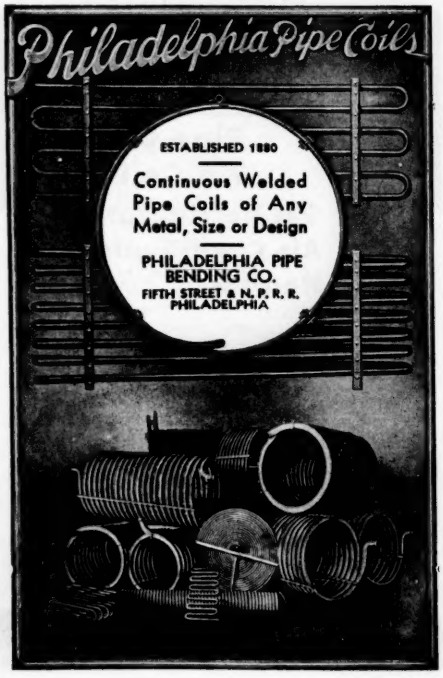
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THE BUYERS

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Vivian Mfg. Co., St. Louis, Mo.

ICE PICK SCABBARDS
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Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.

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Jamison Cold Storage Door Co., Hagerstown, Md.
Refrigeration Engineering Co., Montgomery, Minn.
S & S Vending Machine Co., San Jose, Calif.
United Ice & Oil Supply Co., Boston, Mass.

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National Pipe Bending Co., New Haven, Conn.

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Luse-Stevenson Co., Inc., Chicago, Ill.
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INSULATION ADHESIVES
American Bitumuls Co., San Francisco, Calif.

LOW TEMPERATURE EQUIPMENT
(See Ice Making and Refrigerating Machinery)

MASKS, AMMONIA
Acme Protection Equipment Co., Chicago, Ill.

MATERIALS HANDLING EQUIPMENT
Ohio Galvanizing & Mfg. Co., Niles, Ohio

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Socony-Vacuum Oil Co., Inc., New York, N. Y.
Sun Oil Co., Philadelphia, Pa.
Texas Co., The, New York, N. Y.

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Socony-Vacuum Oil Co., Inc., New York, N. Y.
Sun Oil Co., Philadelphia, Pa.
Texas Co., The, New York, N. Y.

OIL SEPARATORS
King-Zeero Company, Chicago, Ill.
Rex Engineering & Sales Co., Oklahoma City, Okla.

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Socony-Vacuum Oil Co., Inc., New York, N. Y.
Sun Oil Co., Philadelphia, Pa.
Texas Co., The, New York, N. Y.

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Frick Company, Waynesboro, Pa.
Vivian Mfg. Co., St. Louis, Mo.

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Chicago Nipple Mfg. Co., Chicago, Ill.
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National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Rempe Company, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

PIPE COVERING
(See Coverings, Pipe and Boiler)

PIPE WELDING
Acme Industries, Inc., Jackson, Mich.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
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Acme Industries, Inc., Jackson, Mich.
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Deming Co., The, Salem, Ohio
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Layne & Bowler, Inc., Memphis, Tenn.
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Vogt Machine Co., Henry, Louisville, Ky.

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PURGERS
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Frick Company, Waynesboro, Pa.
Rex Engineering & Sales Co., Oklahoma City, Okla.

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Frick Company, Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

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Refrigeration Engineering Co., Montgomery, Minn.
S & S Vending Machine Co., San Jose, Calif.

REFRIGERATING AND ICE MAKING MACHINERY
(See Ice Making and Refrigerating Machinery)

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RUST PREVENTATIVES
Bower Chemical Mfg. Co., Henry, Philadelphia, Pa.
Wright Chemical Corp., Chicago, Ill.

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SECOND HAND MACHINERY AND SUPPLIES
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King-Zeero Company, Chicago, Ill.
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Vilter Mfg. Co., Milwaukee, Wis.
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Lilly Co., The, Memphis, Tenn.
Vivian Mfg. Co., St. Louis, Mo.

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SPRAY PONDS
Frick Company, Waynesboro, Pa.

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UNIT COOLERS
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Howe Ice Machine Co., Chicago, Ill.
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Rempe Company, Chicago, Ill.

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WATER COOLERS
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Niagara Blower Co., New York, N.Y.
Vogt Machine Co., Henry, Louisville, Ky.

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Layne & Bowler, Inc., Memphis, Tenn.

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Wright Chemical Corp., Chicago, Ill.

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All Used Equipment Is Reconditioned In Our Modern Machine Shop

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Compressors With or Without Motors

Item No.
1—4x4 York, 300 RPM 16
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1—6x6 Frick, 237 RPM 21
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Diesel Driven and Diesel Engines
1—8x8 York—Direct connected to 50 HP Fairbanks-Morse at 257 RPM 210

Steam Driven
1—8x8 Vertical York, 300 RPM direct connected 327

Pipe
10,000 feet wrought Iron pipe—2"—like new 451

Complete Ice Plants
1—15-ton electric driven plant 630
1—600 Can Trunk Coil Type—York Plant, Brand New Tank. *Complete with 10 Can Grids. This plant is equal to new* 631
Brand New 8 to 10-ton Clear Ice-Making Plants—110 Cans—Electric or Diesel Drive—2 Can Pull 632
1—247 Can, 22-ton ice plants, like new 632A
1—35-38 ton New Clear Ice Making Plants 635

Item No.
1—150 Ton Multi lift—1622 Can Plant 636
1—702 Can Plant—9 Can Pull 637
1—920 Can Plant—12 Can Pull 638
1—150 Ton Ice Plant—2 Tank 660

Traveling Cranes
2—4 Ton Overhead Traveling Cranes. 9 & 12 Can Grid.

Self-Contained Units
3—4x4 York & Fricks 742
1—5x5 York—390 RPM 743
1—4½x5 Lipman—360 RPM 744
1—3x3 Worthington 748
1—5x5 Frick—Forced Feed—400 RPM Latest Type 758

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1—300 lb. ULINE, fully automatic cuber 501
1—50 lb. F & E Safety Cuber 502

Condensers
3—100 ton shell and tube condensers retubed 919
1—125-ton, Vertical Shell & Tube, 196 2" tubes 921
1—120 ton, 216—2" retubed Vertical Shell & Tube 922
2—20 ton Horizontal—retubed 924

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2000 Cans—Like new—11"x22"x47" 950

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ANY SIZE

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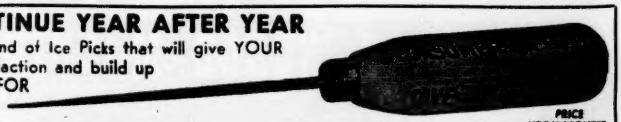

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RATES: $3.50 for 50 words or less; 60c for each additional 10 words or fraction thereof; 75c per line for bold face headings; $6.00 per inch for line listings.

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FOR SALE—Zenith 3 ton portable ice plant, with 10 ton motor and extra compressor for storage room. Can operate at present location or move. Write Zenith Ice Co., Box 414, Garden City, Kansas.

FOR SALE—Complete 100 ton plant, 1100 can 11"x22"x54". Excellent condition; with a 22 can lift, 6½ ton crane, multi-pass condensers, slow speed DeLaVergne, two 10x10 Fricks, pumps, tank coils, filling tank and vertical agitators. All electrical equipment is 25 cycle. Address Box DC-10, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

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Since 1910

Inventory $1,400,000. Two large plants. Gross income 1949, $240,000. Price $520,000 complete.

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WANTED—Link Belt ice crusher with blower. Must be in good used condition. Contact Electric Ice Co., Craft Highway & G.M.O.R.R. Crossing, Prichard, Ala., Telephone 2-8018.

FOR SALE

25-ton Raw Water Ice Plant Vilter equipped

1—9" x 18" Horizontal Flat Belt Drive Compressor with Motor and Belt

1—7½" x 7½" Vilter Vertical V-Belted Compressor and Motor

1—Ice Tank with 380 11½" x 22½" x 49" Cans with Covers, Laterals, Drop Pipe Equipment

Vertical Shell and Tube Condensers with Cooling Tower and Pump Vertical Agitators

Completely Equipped and at present Operating

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FOR SALE—A number of 9x9, 6x6, 5x5 and smaller sizes in standard and self contained units. Shell & tube condensers and brine coolers, ammonia receivers, oil traps, agitators, blowers, coils, new and rebuilt fittings, oil engines, generators, motors. Parke, Pettegrew & Son Co., 370 W. Broad St., Columbus 8, Ohio.

FOR SALE—Frick 7x7 compressor motor 25 h.p. V-belts, shell and tube condenser 18'x16", receivers 14'x10", oil trap and gauges. Good condition, $1000.00 F.O.B. Detroit. Brunswick 6x6 3 cylinder compressor motor 25 h.p. and V-belts $250.00 F.O.B. Detroit. John A. Mistor, 3310 Lockwood, Detroit 10, Mich.

FOR SALE—Gifford Wood scoring machine 10 h.p. motor, 400 lbs.; Ice cans 11½x22½x57; York compressors 9x9, 8x8, 7½x7½, 5x5; Frick 10x10, 7x7; Boston type ice tongs; York 80 ton shell and tube condenser; receivers, oil traps. Write us your requirements. We buy, sell and trade. Gordon Equipment Co., 6530 W. Jefferson Ave., Detroit 17, Mich.

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60 and 100 h.p. Economic boilers
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1—10"x10" York ammonia compressor 200 R.P.M.
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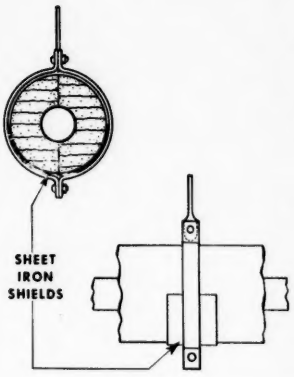

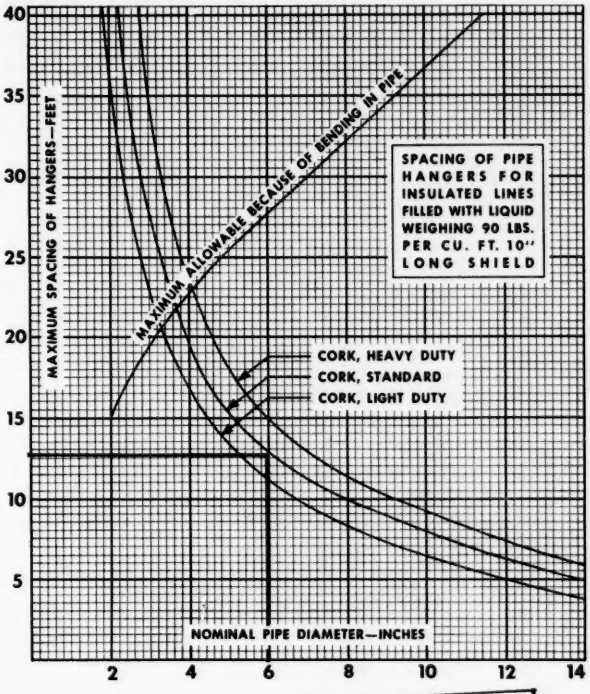

WE HAVE BEEN ASKED:

What is the proper spacing of hangers to support cork insulated lines?

Recently we received a letter which posed the following problem:
"We are redesigning some process piping, and we want to make sure that we correctly space the hangers on our cold lines to avoid compression of the cork covering."

To answer his question we sent this manufacturer the graph shown above. It is a dependable guide to the efficient spacing of hangers. Here's an example of how it works:

Let's assume that lines are filled with liquid weighing 90 lbs. per cubic foot. Shields are 10" long—made of 16-gauge sheet iron—and enclose half the circumference of the covering. Now let's assume that we are going to insulate a 6" pipe with standard thick cork covering. First, draw a red line, as we've done on the graph above, from the 6" indication at the bottom of the graph to the point where it intersects the line marked Cork, Standard. Then carry the line to the left. Read the figure at the point where it reaches the left-hand margin. That figure tells how many feet apart hangers should be spaced. Under the conditions of this problem—12½ feet.

While this chart applies only to liquids weighing about 90 pounds per cubic foot and for 10" shields of 16-gauge sheet iron, similar charts can be developed for other liquids and methods of hanging cork covering. So the next time you plan a cold line installation call in your Armstrong engineer.

He'll be able to give you the best hanger specification for your particular needs. You'll find that he can help you in other ways, too, because almost every insulation job presents some problems that his knowledge and experience can help solve.

IF YOU HAVE ANY QUESTIONS on low- or high-temperature insulations, feel free to call the engineer in your nearest Armstrong district office or write to the Armstrong Cork Company, 4503 Concord Street, Lancaster, Pennsylvania.

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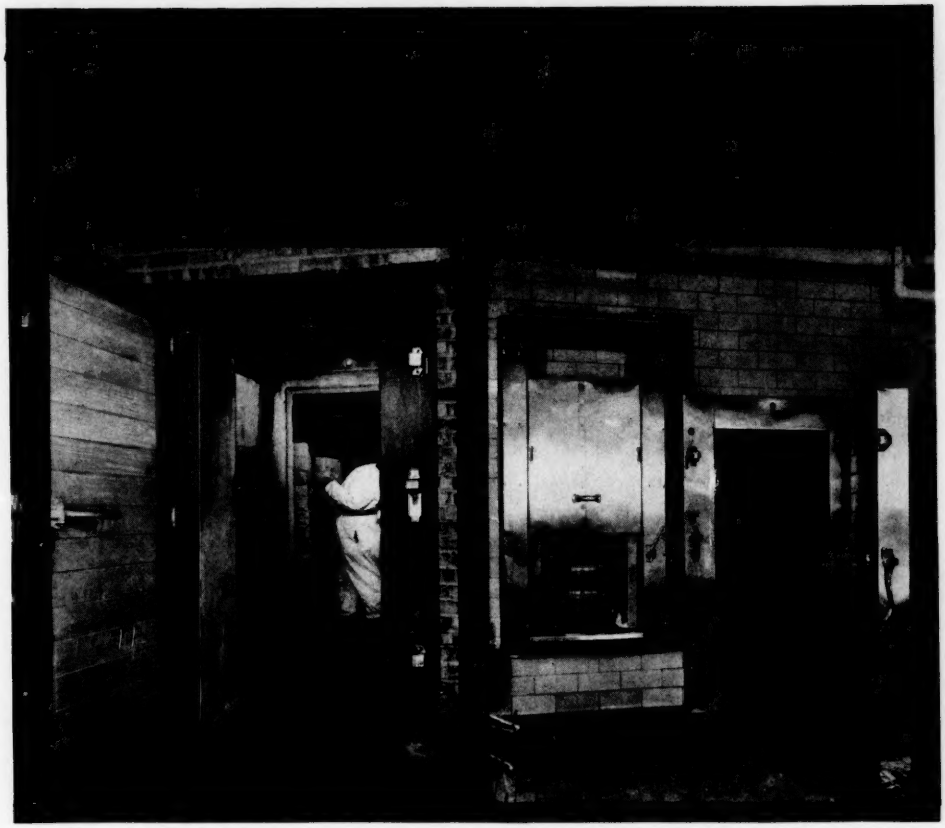

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